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Scientific Articles

STUDY OF TISSUE RESPONSE TO POLYVINYL RESIN SPONGE IMPLANTS IN JAWS OF DOGS
William J. Dresser and Henry B. Clark, Jr. 3

PAIN CONTROL WITH A MIXTURE CONTAINING DEXTRO PROPOXYPHENE HYDROCHLORIDE, A MIXTURE CONTAINING CODEINE PHOSPHATE AND A PLACEBO
William A. Wagner and Adrian O. Hubbell 14

DENTAL CARE PLANNING IN HOSPITALS
Fred A. Henny 18

PARESTHESIA: EVALUATION OF 16 CASES
Victor H. Frank 27

DISINFECTION, ANTIBIOSIS AND STERILIZATION IN MODERN DENTISTRY
Sol Haberman 33

USE AND ABUSE OF ANTIBIOTICS IN DENTISTRY
Edward J. Degnan 43

STERILIZATION OF ANESTHETIC CARTRIDGES IN OFFICE PRACTICE
Robert V. Walker 48

ARMAMENTARIUM FOR SURGERY IN OFFICE PRACTICE
Welden E. Bell 52

Case Reports

TREATMENT OF OROANTRAL FISTULA
Richard J. Burch and Edward C. Funk ..58

BILATERAL INVERTED SUPERNUMERARY CENTRAL INCISORS PENETRATING NASAL CAVITY
James H. Quinn and Miles Lewis 61

Editorials 63

Queries and Comments 66

Book Reviews 68

Current Literature 73

Announcements 82

Annual Index 84

Lon W. Morrey

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Fred A. Henny

Editor—Journal of Oral Surgery, Anesthesia and Hospital Dental Service

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Study of tissue response to polyvinyl resin sponge implants in the jaws of dogs

■ *William J. Dresser,* D.D.S., M.S.D., and Henry B. Clark, Jr.,† M.D., D.D.S., Minneapolis*

Polyvinyl resin sponge implants are not advocated for use in rebuilding alveolar ridges, because of a high incidence of failures resulting from infection or loss of covering epithelium. Replacement of the sponge by bone is delayed in those instances in which infection does not supervene. Other clinical applications will require further investigation.

In the practice of dentistry, the success of the dentist's endeavors is sometimes limited because of a deficiency of maxillary or mandibular bone. The loss of substance may be the result of osteomyelitis, traumatic injury, a developmental defect, or surgical resection of a neoplasm. However, the most common example of bone deficiency is that of severely resorbed alveolar ridges, often associated with ill-fitting dentures. These situations present a very serious problem for both patient and prosthodontist. Frequently, bone loss is produced deliberately by the dentist in the course of removal of teeth, smoothing of bony projections, and removal of undercuts of the alveolar ridge. Occasionally, the removal of upper posterior teeth involves removal of a portion of the maxillary sinus floor. This leaves the sinus membrane unsupported and prone to easy rupture.

A great many technics have been developed for the management of these conditions, and, in the course of time, numerous foreign implant materials have been tested. None has been entirely satisfactory.

Favorable reports have appeared regarding the use of polyvinyl resin (Ivalon) sponge in surgery, and the material appears to merit further investigation of possible dental uses. To explore further its potential uses, this study of the tissue reaction to polyvinyl resin implants in the jaws of dogs was performed.

■ *Review of the Literature*

Polyvinyl resin sponge is a white, odorless and tasteless material formed by foaming polyvinyl alcohol and hardening it with formaldehyde.[1] The finished product, on a cut surface, appears much the same as sliced white bread, since there is a myriad of communicating spaces of varying sizes. When dry, the material is hard and nonpliable; when wet, it is soft, compressible and elastic. It is more easily cut with a sharp knife or scissors while moistened. Sterilization is accomplished by boiling.

The first recorded work with polyvinyl sponge in surgery was that of Grindlay and Clagett,[2] who used dogs. These researchers performed a pneumonectomy followed by placement of sponge in the thoracic defect thus formed. The results were encouraging, and two years later Grindlay and Waugh[1] reported on further studies with dogs. In this study, sponge implants were placed in pleural spaces, rib beds, diaphragm, muscle, subcutaneous tissue, cartilage, and beneath the periosteum of the frontal bone. Except for two instances in which sponge had been placed subcutaneously beneath a skin incision, no systemic reactions were observed, nor was there evidence of local tenderness or induration. The implants seemed to remain the same size and to assume the firmness of a mass of fibrous tissue of the same size and shape. Histologic studies confirmed this impression, for the sponge became infiltrated with fibrous connective tissue. These findings led the authors to conclude that the sponge acted as a "framework for living tissue."

One of the earliest reports of polyvinyl resin sponge in clinical use is provided by Gale and co-workers.[3] This group first studied the effect of polyvinyl resin implants in various soft tissues of the dog, including the pleural cavity, and corroborated the findings of Grindlay and coworkers. This encouraged them to use the sponge in human patients, and a report of 50 clinical cases was made. Of the 50 cases, 46 had no complications. In two instances it was necessary to remove the implants because of localized infection, and in two other instances the patients expired from causes not attributable to the use of the sponge.

Several investigators[1,4] have reported using the material to reinforce aortic aneurysms. Still others[5,6] have molded the material so as to use it for aortic and arterial grafts in dogs. Also, in the field of cardiovascular surgery, plugs of this material have been shaped and placed to close septal defects.[7,8]

Polyvinyl resin (Ivalon) sponge has been used in plastic surgery to build out body contours;[9-11] in eye surgery, to restore the normal position of the eye with orbital implants;[12-14] and, in general surgery, in the repair of difficult hernias.[15,16]

Struthers[17] reported on his work in which he used polyvinyl resin sponge as an experimental substitute for bone. Using dogs, he implanted the plastic sponge within skeletal tissues, in surface contact with skeletal tissues, and in extraskeletal tissues. His implants were plain sponge and sponge which was perfused with a saline suspension of ground autogenous bone. The sites of implantation were prepared beds in cancellous bone of the sternum, periosteal bed of resected ribs, and rectus abdominis muscle. In all

situations, the sponge was found to be well tolerated, there being no gross evidence of foreign body reaction. Specimens taken at four weeks exhibited some foreign body giant cells, but these disappeared in succeeding sections up to 20 weeks. His studies led the author to the following conclusions:

> New bone will grow about and within polyvinyl sponge from skeletal tissues within four weeks but does not completely infiltrate the sponge during a period of twenty weeks. This growth of bone occurs most consistently from adjacent cancellous bony surfaces and is increased by the addition of chips of smaller particles of autogenous bone to the implant of sponge.

■ *Methods and Procedures*

Six mongrel dogs were selected as the experimental animals for this study. In all the surgical procedures, the anesthetic used was thiamylal sodium (Surital) in a 2.5 per cent solution in quantities sufficient to produce a plane of surgical anesthesia. The same principles of asepsis and surgical technic practiced in clinical oral surgery were applied in these experimental operative procedures.

In preparation for the experiment the upper and lower premolar teeth of five dogs were extracted on one side. In the sixth dog all premolar teeth were removed. The wounds were allowed to heal for four to six weeks so that complete obliteration of both mucosal and bony defects had occurred by the time of implantation. There were two reasons for this preparation of operative sites. First, it was felt that the edentulous regions produced in the mouths of the dogs would closely simulate those encountered in human beings who might be candidates for alveolar ridge implants. Second, by the extraction of opposing premolars, trauma to the implant site as a result of mastication would be minimized.

Two types of implantation technics were used. In the edentulous mandibular ridge, a recessed or inlay type implant was inserted. A mucoperiosteal flap was first raised and reflected from the underlying bone. The crest of cortical bone was removed with a bur, and a bed was prepared in medullary bone to accommodate the sponge implant (Fig. 1, above left). An implant of proper size was cut and shaped with scissors at the operating table and placed into the prepared bed (Fig. 1, above center). It was purposely cut larger than the defect in order to determine whether ridge height might be increased by this technic. The flap was relaxed by incising the periosteum in several places and was closed with minimal tension on the suture line (Fig. 1, above right).

The edentulous maxillary region was utilized in the following manner: After the mucoperiosteal flap had been raised, the implant was laid directly over the lateral aspect of the alveolar process (Fig. 1, below left). This flap was also relaxed with incisions through the periosteum and was then returned to place and sutured with no. 000 gut sutures (Fig. 1, below right). The shape of the implant was roughly cubical except that in each instance it was trimmed slightly to present a rounded external surface. No attempt was made to fix any of the implants in place with sutures.

Thus, by employing two different technics it was hoped that two effects might be observed. First, the general de-

gree of acceptance of polyvinyl sponge by the tissues could be studied in both upper and lower jaws. Second, the difference in effect of an inlay versus an onlay type of implant could be observed.

At the time of operation each dog was given an intramuscular injection of 400,000 units of fortified penicillin. A similar dose was given once daily for the first two postoperative days.

Each animal was observed daily for approximately one week after surgery and weekly thereafter until specimens were taken. Particular note was taken of the state of health of the covering mucosal flap, firmness of the underlying sponge, and mobility of tissue overlying the sponge.

Each sponge was later removed for histologic study by wide excision including surrounding bone and soft tissue. Implants were removed at intervals of from 4 to 28 weeks. When the last specimen was taken from each dog, the animal was sacrificed with intravenous pentobarbital sodium in lethal dosage.

Each specimen was thoroughly fixed in 10 per cent Formalin, decalcified in nitric acid, and routinely prepared and stained with hematoxylin and eosin.

■ *Results*

Clinically, the implant region could be easily compressed for almost a week postoperatively, but then the sponge would become increasingly more firm. After four weeks the sponge was readily palpable but very hard. At the time of removal, the implants eight weeks old or older were indistinguishable from bone in hardness. At 28 weeks, there seemed to be a definite decrease in the size of the

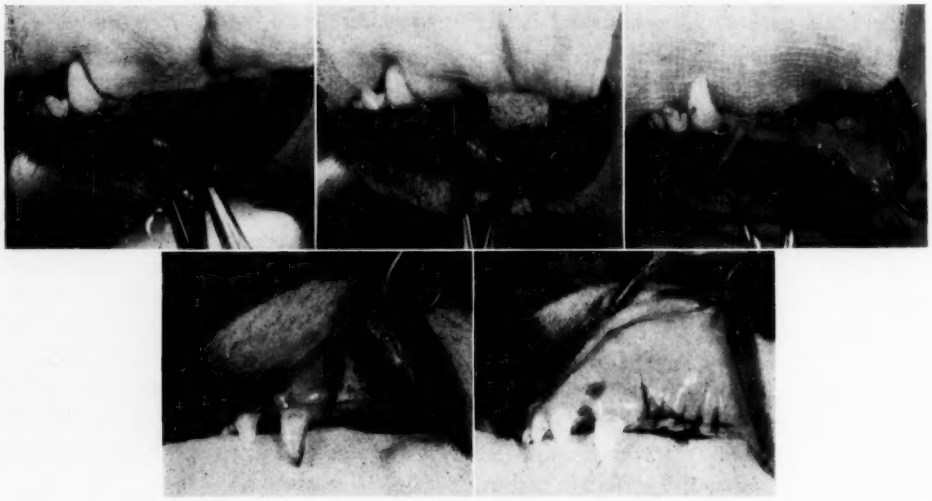

Fig. 1—Above left: Bed prepared in bone to receive inlay. Above center: Sponge inlay in position just prior to closure of mucoperiosteal flap. Above right: Closure of mucoperiosteum over inlay. Below left: Sponge onlay in position. Below right: Closure over sponge onlay

Table
Observations on polyvinyl resin sponge implants

Implant number	Life of implant	Clinical observations	Ultimate fate	Brief microscopic appearance
I-1*	4 weeks	Healthy	Biopsy	Immature connective tissue. Few giant cells
I-2	8 weeks	Healthy	Biopsy	Mature connective tissue invasion
I-3	12 weeks	Healthy	Biopsy	Mature connective tissue invasion
I-4	5 weeks	Exposed	Removed	No specimen
I-5a†	1 week	Exposed	Removed	No specimen
I-5b‡	10 weeks	Exposed	Removed	No specimen
I-6	28 weeks	Healthy	Biopsy	Complete invasion by immature osseous tissue
I-7a	3 days	Exposed	Removed	No specimen
I-7b	2 weeks	Exposed	Dog lost	No specimen
O-1§	4 weeks	Healthy	Biopsy	Immature connective tissue. Few giant cells
O-2	8 weeks	Exposed	Biopsy	Granulomatous
O-3	12 weeks	Healthy	Biopsy	Mature connective tissue invasion
O-4	16 weeks	Healthy	Biopsy	Mature connective tissue
O-5	20 weeks	Exposed and repaired	Biopsy	Mature connective tissue
O-6	28 weeks	Healthy	Biopsy	Complete invasion by immature osseous tissue
O-7	6 weeks	Healthy	Dog lost	No specimen

*I refers to inlay. Arabic numerals denote animal number.
†a designates implant which was lost or removed.
‡b designates second implant placed in a given site.
§O refers to onlay.

implants. Some of the implants became exposed through an ulcerated region of overlying mucosa. Such exposures occurred as early as three days postoperatively and as late as ten weeks postoperatively. When this occurred, the sponge was removed. In each instance gross infection was not in evidence, and, although superficial portions of the sponge appeared avascular, deeper portions were very firmly adherent to underlying tissue. Reimplantation was accomplished in some of these instances of failures. The table is a highly condensed résumé of the results of this study.

Microscopically, there was, for all practical purposes, no difference between the inlays and onlays. At four weeks, the epithelium covering the sponge was normal. Within and around the sponge were numerous white cells, a few giant cells, and a great deal of immature connective tissue. Capillaries were observed within the interstices of the sponge. There was no suggestion of any invasion by osseous tissue (Fig. 2). In contrast to the relatively healthy picture seen when an implant remained covered with mucosa, Figure 3, above, shows the microscopic picture if an implant became exposed.

At eight weeks, all evidence of foreign body reaction had disappeared, and the sponge appeared to be well accepted by surrounding tissue. The connective tissue was of a less cellular and more mature character (Fig. 3, below).

Twelve-week-specimens were not remarkably different from those of eight weeks. The connective tissue was decidedly mature, and all signs of inflammatory and foreign body reactions were absent. A sharp demarcation was present between bone and sponge, but the compatibility of these tissues with sponge seemed quite evident (Fig. 4). Sixteen and 20-week-specimens were essentially the same clinically and histologically as the 12-week-implants.

Twenty-eight weeks after implantation, the implants were very hard and somewhat smaller than when placed. Microscopically, the sponge was surrounded by darkly stained tissue. This was interpreted as immature, coarse, fibrillar bone. Figure 5 shows a low and high power microscopic view of this 28 week specimen.

■ *Discussion*

At the outset it was hoped this study might show polyvinyl resin sponge to be a suitable substitute for bone lost as a result of surgery, trauma, excessive resorption, or pathological processes. It is the authors' feelings that, for two reasons, the material has not been shown to be useful for this purpose by this study.

The first adverse finding which would contraindicate the application of this technic to human subjects is the failure of roughly one third of the implants due to loss of covering epithelium. It is entirely possible that the basis for this failure was infection occurring at the time of implantation, which the body defenses of the animals plus the antibiotic administered were inadequate to prevent. Operations within the oral cavity of man or dog are manifestly septic procedures. The high percentage of successful takes reported by other workers in regions other than the oral cavity leads to the impression that wound infection must be given serious consideration as a factor of importance. Further studies directed toward a more aseptic technic or a more effective coverage by antibiotics would be indicated if the polyvinyl resin sponge showed outstanding promise.

The majority of failures occurred where the implant was of the inlay type. Since these were all in the mandibular region, which does not have as rich a collateral circulation as seen in the maxilla, it could be theorized that failures were caused by impaired blood supply to the mucoperiosteal flap. It is difficult to see why removal of bone to accommodate the implant should predispose the implant to failure. Because each implant was opposed by the other implant in the opposite jaw, it does not seem likely that the inlays were subjected to more trauma in mastication than the onlays, which did not suffer the same high mortality. If a single cause could be assigned for the disparity in success of the two types of implants, the factor of reduced circulation to the flap probably would be selected.

An effort was made to eliminate all angular prominences from the implants. Even so, the exposures always began at one edge of the sponge implant and then expanded over the remainder. It is likely

that, as the sponge became increasingly firm from connective tissue infiltration, any slightly angular prominence, in the presence of external pressure or trauma, served as an irritant to overlying mucosa in much the same way as a denture irritates mucosa overlying a partially erupted tooth.

The second point which must be assessed is the failure of the substance to demonstrate any great osteogenetic potential. It would almost appear that bone is reluctant to enter the mass of organized connective tissue filling the scaffold provided by the polyvinyl sponge. Bone did not enter until the seventh month; the hypothetical equivalent in human experience would be several years.

In this study, the material used provoked minimal foreign body reaction, an observation which has been reported by others. There was no evidence indicating that the material was chemically incompatible with living tissue. On the contrary, wounds were observed to heal, and healthy connective tissue was shown to invade the sponge. Bone was present in both specimens which were allowed to remain in place for 28 weeks. When the experiment was outlined, it was not anticipated that osteogenesis, if demonstrated, would require so long a time. If it is assumed that one of the prime requirements of any defect-filling substance is the ability to stimulate the production of new bone promptly, polyvinyl sponge would appear to be far less satisfactory than other substances which have been reported.

Another question which is left unanswered by this study is the matter of the effect of intermittent pressures on the implant site as might be anticipated if the ridge were utilized as a base for some prosthetic device.

In planning this project, it was felt that invasion of the implants by bone might be more likely to occur if the sponge were placed in medullary bone rather than merely laid on cortical bone, since medullary bone is more vascular and possesses a higher concentration of osteogenetic elements. Although bone was produced in only two instances, one inlay and one onlay, osseous tissue was produced just as rapidly in each. Since healing and subsequent infiltration of sponge with connective tissue seems to occur equally well in both situations, it appears that no advantage would be gained by removing cortical bone to provide a bed if the material were to be used in a practical case.

There are some situations which might justify clinical trial with polyvinyl resin sponge implants. The use of this material to fill spaces remaining after removal of uninfected neoplastic processes in bone is worthy of investigation. Instances in which bone has been lost as a result of traumatic injury or extraction accidents might be cared for by implantation of this substance. When these situations arise, there is usually mucoperiosteum to cover an implant completely without placing tension on either sponge or wound edges. The individual situation would have to be evaluated carefully to rule out the presence of infection or an open defect into the antrum or nasal cavity.

■ *Summary and Conclusions*

A study using dogs as the experimental animals was undertaken to observe the reaction of living tissue to

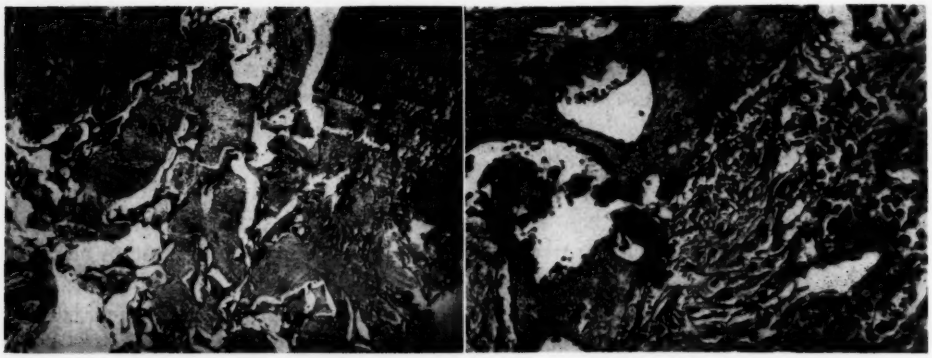

Fig. 2—Implant I-1. Four week specimen. Left: Trabeculae of bone are seen at lower left with sponge and connective tissue between medullary bone and normal oral epithelium. Cellular infiltrate is prominent in upper part of photomicrograph. Right: Particle of sponge occupies left portion of field. Red blood cells are seen in spaces within sponge. Cellular, immature connective tissue is present at right. Numerous leukocytes are present

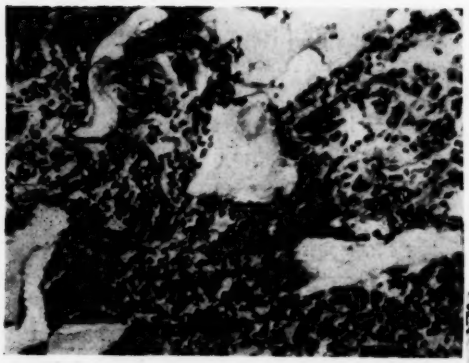

Fig. 3—(Above) Implant O-2. Eight week specimen showing considerable leukocytic infiltration about sponge associated with loss of portion of epithelial covering

(Below) Implant I-2. Eight week specimen. Field selected is deeper portion where sponge rests in bone. Sponge appears as irregular masses in center of field. Connective tissue at upper left part of field is less cellular and relatively free from leukocytic infiltration. Mature bone is present and intimately associated with sponge

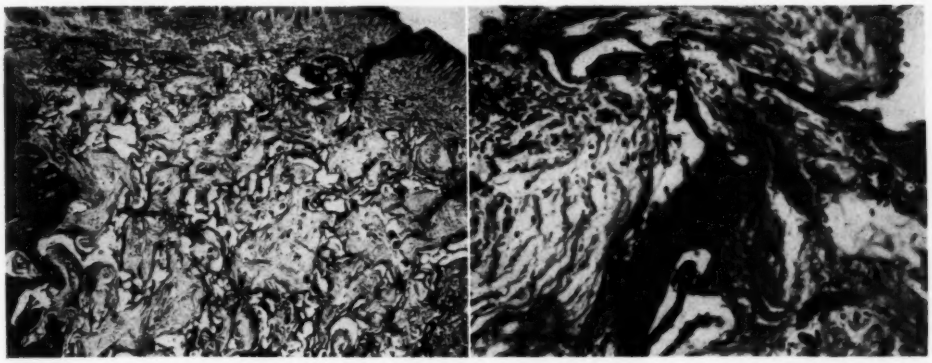

Fig. 4—Implant I-3. Twelve week specimen. Left: Many spaces are seen from which sponge has been lost during histological preparation. Sharp demarcation between sponge and bone indicates no tendency for sponge to serve as framework for invasion of new bone. Very little inflammatory exudate is present in connective tissue. Right: Sponge is darkly stained here. Acellular character of surrounding connective tissue can be seen

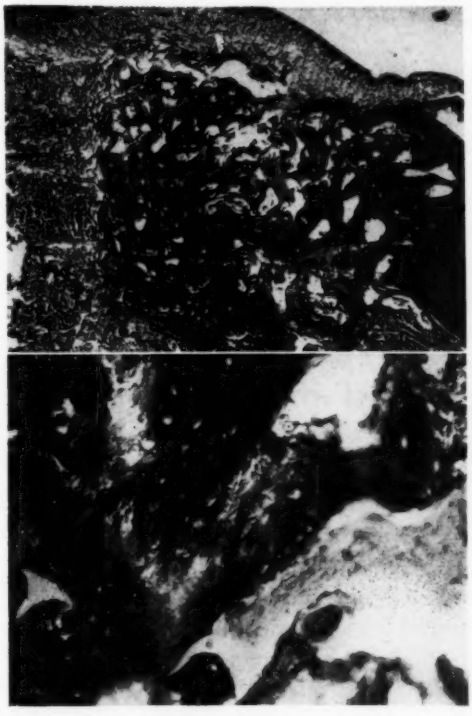

Fig. 5—Implant I-6. Twenty-eight week specimen. Oral epithelium can be noted at top of section. Coarse fibrillar bone is invading sponge. No inflammation is present

Portion of lighter staining sponge from central portion of implant I-6 is shown in lower right part of picture. Immature bone which has invaded interstices of sponge is shown predominating field

implants of polyvinyl sponge and to determine the suitability of this material for implantation in human jaws. The project was arranged to compare the effects of insertion in medullary bone against the results from placement over cortical bone.

Nine polyvinyl resin sponge implants were embedded in medullary mandibular bone (inlays) and seven were placed over cortical maxillary bone (onlays). All were covered by mucous membrane and periosteum. The implantation procedures were accomplished under the same conditions of asepsis and utilized surgical technics commonly employed in clinical oral surgery. Implants were excised for biopsy after they had been in place for intervals of time ranging from 4 weeks to 28 weeks.

Four inlay-type implants and five onlays (approximately two-thirds) were maintained in a healthy state for the entire period of their observation. The remainder failed either because of infection or by loss of covering epithelium.

Microscopic examination of those implants which retained mucosal coverage until the time of biopsy revealed the following:

1. A very minimal foreign body reaction was observed in sponges which had been in place four weeks.

2. Implants older than four weeks were surrounded and infiltrated with fibrous connective tissue, and there was no evidence of foreign body reaction.

3. Biopsy specimens taken after 28 weeks (two specimens) showed that the implants were surrounded and infiltrated by immature osseous tissue.

From this study the following conclusions may be drawn:

1. Polyvinyl resin sponge is compatible with surrounding tissues in the jaws of dogs, provided that infection does not supervene and that intact mucosal covering is maintained.

2. The end result of implantation within medullary bone is essentially the same as with placement over cortical bone.

3. Application of this technic to human subjects for the purpose of building up alveolar ridges is not justified because of the high percentage of failures and the minimal osteogenetic potential demonstrated.

4. The use of polyvinyl sponge in situations in which a sterile field may be provided and in which early production of bone is not essential is not contraindicated by the results of this study.

■ *Selected Reading*

Amler, M. H.; Johnson, P. L., and Bevelander, Gerrit. Histological studies of bone regeneration following plastic sponge grafts. Internat. A. D. Res. Preprinted Abs. 90 March 24, 1957.

Berman, Nicholas. Methods for improving implant dentures. Oral Surg., Oral Med. & Oral Path. 8:227 March 1955.

Bienstock, J. S. Implants. Review of research, as regards tissue reaction to metal, plastic, and dental implants. Oral Surg., Oral Med. & Oral Path. 8:430 April 1955.

Blackstone, C. H., and Parker, M. L. Rebuilding the resorbed alveolar ridge. J. Oral Surg. 14:45 Jan. 1956.

Brown, J. B.; Fryer, M. P., and Lu, M. Polyvinyl and silicone compounds as subcutaneous prostheses; laboratory and clinical in-

vestigation. A.M.A. Arch. Surg. 68:744 June 1954.

Charbon, B. C., and Adams, W. E. Study to determine the effect of prevention of overdistention of the remaining lung tissue on the elevated right ventricular pressures, following the resection of lung tissue in dogs. J. Thoracic Surg. 23:341 April 1952.

Dodge, H. W., Jr., and others. Use of polyvinyl sponge in neurosurgery. J. Neurosurg. 11:258 May 1954.

Gerry, R. G. Alveolar ridge reconstruction with osseous autograft: report of case. J. Oral Surg. 14:74 Jan. 1956.

Moore, A. M., and Brown, J. B. Investigation of polyvinyl compounds for use as subcutaneous prostheses. Plast. & Reconstr. Surg. 10:453 Dec. 1952.

Oppenheimer, B. S., and others. Malignant tumors resulting from embedding plastics in rodents. Science 118:305 Sept. 11, 1953.

Schilling, J. A.; Favata, B. V., and Radakovich, M. Studies of fibroplasia in wound healing. Surg., Gynec. & Obst. 96:143 Feb. 1953.

Shumway, N. E.; Lewis, F. J., and Gliedman, M. L. Plastic blood vessels made of polyvinyl sponge. Lancet 75:348 Aug. 1955.

Thoma, K. H., and Holland, D. J. Peripheral osteotomy with tantalum gauze inserts for large mandibular tumors. Oral Surg., Oral Med. & Oral Path. 3:830 July 1950.

Weinmann, J. P., and Sicher, Harry. Bone and bones, ed. 2. St. Louis, C. V. Mosby Co., 1955.

*Clinical instructor in oral surgery, School of Dentistry, University of Minnesota.

†Professor and chairman, division of oral surgery, School of Dentistry, University of Minnesota.

1. Grindlay, J. H., and Waugh, J. M. Plastic sponge which acts as a framework for living tissue; experimental studies and preliminary report of use to reinforce abdominal aneurysms. A.M.A. Arch. Surg. 63:288 Sept. 1951.

2. Grindlay, J. H., and Clagett, O. T. Plastic sponge prosthesis for use after pneumonectomy: preliminary report of experimental study. Proc. Staff Meet., Mayo Clin. 24:538 Oct. 12, 1949.

3. Gale, J. W., and others. Plastic sponge prosthesis following resection in pulmonary tuberculosis. J. Thoracic Surg. 24:587 Dec. 1952.

4. Thurlow, A. A., Jr.; Rapport, R. L., and Curtis, G. M. Abdominal aneurysm wrapping with polyvinyl formal sponge; report of case with duodenal perforation. A.M.A. Arch. Surg. 65:920 Dec. 1952.

5. Shumway, N. E.; Gliedman, M. L., and Lewis, F. J. Experimental study of the use of polyvinyl sponge for aortic grafts. Surg., Gynec. & Obst. 100:703 June 1955.

6. Mortensen, J. D., and others. Reinforcement of fresh autogenous venografts to aorta; experimental study with polyvinyl formalized (Ivalon) sponge. A.M.A. Arch. Surg. 70:545 April 1955.

7. Donald, D. E.; Kirklin, J. W., and Grindlay, J. H. Use of polyvinyl sponge plugs in closure of large atrial septal defects created experimentally. Proc. Staff Meet., Mayo Clin. 28:288 May 20, 1953.

8. Johns, T. N. P., and Blalock, A. Mitral insufficiency: experimental use of a mobile polyvinyl sponge prosthesis. Ann. Surg. 140:335 Sept. 1954.

9. Freeman, B. S. Complications following subcutaneous insertion of plastic sponge. Plast. & Reconstr. Surg. 15:149 Feb. 1955.

10. Kiskadden, W. S. Operations on bosoms dangerous. Plast. & Reconstr. Surg. 15:79 Jan. 1955.

11. Johnson, H. A., and Grindlay, J. H. Experimental alteration of nasal contour by the use of polyvinyl sponge. Plast. & Reconstr. Surg. 14:293 Oct. 1954.

12. Donin, J. F.; Henderson, J. W., and Grindlay, J. H. Evisceration of the eye with implantation of polyvinyl sponge; experimental study. A.M.A. Arch. Ophth. 54:373 Sept. 1955.

13. Pearlman, M. D. Recommendations for the utilization of polyvinyl plastic sponge as an orbital implant. Tr. Am. Acad. Ophth. 57:910 Nov.-Dec. 1953.

14. Henderson, J. W. Reconstruction of the orbit with polyvinyl sponge; report of case. A.M.A. Arch. Ophth. 50:714 Dec. 1953.

15. Schofield, T. L., and others. Use of polyvinyl sponge in repair of experimentally produced defects in the abdominal wall. A.M.A. Arch. Surg. 68:191 Feb. 1954.

16. Schofield, T. L. Polyvinyl alcohol sponge; inert plastic for use as a prosthesis in the repair of large hernias. Brit. J. Surg. 42:618 May 1955.

17. Struthers, A. M. Experimental study of polyvinyl sponge as a substitute for bone. Plast. & Reconstr. Surg. 15:274 April 1955.

■ ACTION

If you have something to do that is worth while doing, don't talk about it, but do it. After you have done it, your friends and enemies will talk about it.—*George W. Blount.*

Pain control with a mixture containing dextro propoxyphene hydrochloride, a mixture containing codeine phosphate and a placebo

■ *William A. Wagner, D.D.S., and Adrian O. Hubbell, D.D.S., Long Beach, Calif.*

A double blind study on 7,000 oral surgery patients was done to test the efficacy of a new nonnarcotic analgesic agent: dextro propoxyphene hydrochloride. The results were encouraging inasmuch as the relief from postoperative pain was about equal to the relief obtained from 32.5 mg. of codeine, but a decided reduction in bothersome side reactions was noted.

The problem of controlling preoperative and postoperative pain associated with tooth extraction has resulted in the use of a great variety of drugs. Among the most effective and widely used has been codeine in a combination with acetylsalicylic acid mixture.

The search for synthetic analgesics without the undesirable side reactions frequently produced by codeine or other alkaloids of opium, resulted in the discovery of dextro propoxyphene hydrochloride (*a*-*d*-4-dimethylamino-1,2-diphenyl-3-methyl-2-butanol propionate hydrochloride).

In this study an evaluation of the comparative analgesic effect of two mixtures and a placebo was made on patients who had been subjected to oral surgical procedures producing three degrees of postoperative painful stimulus. The mixtures studied were the following:

1. A mixture containing 227 mg. acetylsalicylic acid, 162 mg. acetophenetidin, 32 mg. caffeine, and 32.5 mg. codeine phosphate (A.S.A. and Codeine Compound No. 3).

2. A mixture containing 32 mg. dextro propoxyphene hydrochloride, 162 mg. acetophenetidin, 227 mg. acetylsalicylic acid, and 32.4 mg. caffeine (Darvon Compound).

■ *Material and Method*

Three medicaments in capsules of identical appearance were given patients after oral surgical procedures. A double blind technic was used. A record of medication, sex, age group and type of surgical procedure performed was kept for each patient receiving the capsules. The type of surgical procedure performed was divided into simple tooth extraction, tooth extraction with alveolectomy and removal of an impacted tooth, in an effort to evaluate the effectiveness of the drugs in three levels of pain stimuli.

The three medicaments were (1) the mixture with codeine phosphate, (2) the mixture with dextro propoxyphene and (3) a placebo. Each patient received six capsules with instructions to take one or two every four hours as needed for pain.

Of the patients given medication, 5,539 returned to the office for routine postoperative care. At this visit the records were completed by questioning each patient. The number of capsules taken in the first 24 hours after surgery, the degree of relief obtained whether complete, partial or no relief and the evidence of any side effects noted by the patient were recorded.

■ *Results*

In the series, 4,077 of the 5,539 patients reporting had pain enough to require analgesia. The patients' ages ranged from 15 to 93 years; 2,545 were female and 1,532 male.

Of this number, 937 patients had simple tooth extractions, 2,495 had tooth extraction with alveolectomy and 645 had impacted teeth removed. A total of 1,843 received the mixture containing codeine, 1,831 received the mixture containing dextro propoxyphene and 1,864 received a placebo. Table 1 is a summary of the patients' estimations of analgesia obtained from three preparations at three levels of pain stimuli. The table shows the number of patients who experienced each of the three degrees of surgical stimuli. These patients are also compared with respect to the degree of analgesic effect obtained from each of the medications.

Analysis of the 410 patients who experienced complete relief of pain after the most severe surgical stimuli, that is, removal of impacted teeth, showed that 151 took the mixture with codeine, 153 took the mixture with dextro propoxyphene and 106 took the placebo.

A similar analysis of the 1,894 patients who obtained complete relief after having had a tooth extraction with alveolectomy showed that 681 took the mixture with codeine, 660 took the mixture with dextro propoxyphene and 553 took the placebo.

Of those 729 patients who received complete relief from pain after the least of the three degrees of surgical stimuli, 283 took the mixture containing codeine, 215 took the mixture containing dextro propoxyphene and 231 took the placebo.

These findings are in contradiction to those of Beecher,[1] who stated that there is evidence that placebos are most effective when the stress is greatest. He further stated that in a review of 15 studies by other investigators involving 1,082 patients, he found that placebos had an average significant effectiveness of 35.2 per cent. Our findings more closely parallel those of Keesling and Keats,[2] who

Table 1

Relief of pain after three different surgical procedures

Medication	Total no. patients	No. and % of patients, by degree of relief from pain					
		Complete		Partial		No	
		No.	%	No.	%	No.	%
A. After removal of impacted teeth							
Mixture with codeine	199	151	75.9	38	19.1	10	5.0
Mixture with dextro propoxyphene	230	153	66.5	62	27.0	15	6.5
Placebo	216	106	49.1	75	34.7	35	16.2
B. After extraction and alveolectomy							
Mixture with codeine	830	681	82.1	118	14.2	31	3.7
Mixture with dextro propoxyphene	818	660	80.7	105	12.8	53	6.5
Placebo	847	553	65.3	185	21.8	109	12.9
C. After simple extraction							
Mixture with codeine	337	283	84.0	33	9.8	21	6.2
Mixture with dextro propoxyphene	268	215	80.2	38	14.2	15	5.6
Placebo	332	231	69.6	62	18.7	39	11.7

found that the placebo gave adequate relief from pain in 61 per cent of the patients in their study of analgesics in the treatment of pain of alveolar osteitis.

A valid statistical analysis[3] was made using data presented in Table 1. Differences in surgical procedures were associated with significant differences in the estimates of pain relief. Thus, it appears that the more traumatic the procedure, the lower the estimate of pain relief. The medications as well were associated with highly significant differences in the estimated pain relief. Both the mixture containing codeine and the mixture containing dextro propoxyphene, when compared to the placebo, provided pain relief after oral surgical procedures.

■ *Side Effects*

Table 2 shows that undesirable side effects most frequently reported were nausea, vomiting, drowsiness and dizziness. The administration of the mixture with codeine resulted in 2.6 times as many patients having experienced one or more of the side effects listed in Table 2 as did those patients who received the mixture with dextro propoxyphene. The effect of the mixture containing codeine is even more striking when contrasted with the difference between the mixture containing dextro propoxyphene and the placebo. Beecher[1] has observed some 35 different toxic side effects from placebos in one or more of his studies. Wolf and Pinsky[4] reported that in their investiga-

Table 2 • Distribution of patients having side effects from medication

Side effects	Medication		
	Mixture with codeine	Mixture with dextro propoxy-phene	Placebo
Nausea	92	33	27
Vomiting	39	14	8
Drowsiness	50	21	28
Dizziness	49	23	16
Gastric upset	19	4	5
Dry mouth	8	8	2
Other effects	18	14	12
Total	275	117	98

tion of 31 instances of side reactions after the administration of a placebo, three were severe in degree and involved symptoms such as weakness, palpitation, nausea, rash, epigastric pain, diarrhea, urticaria and angioneurotic edema. In this study we found that nausea, vomiting, drowsiness and dizziness were seen most frequently when the mixture containing codeine was administered. Only a slight increase in these symptoms was noted when the mixture containing dextro propoxyphene was compared to the placebo; there were actually more instances of gastric upset with the placebo than with the mixture containing dextro propoxyphene. The mixture with dextro propoxyphene and the mixture with codeine had a drying effect on the oral secretions in an equal number of patients, whereas only two patients taking the placebo experienced this side effect. Beecher[1] has observed this phenomenon in 9 per cent of the patients in his studies with placebos.

Gruber[5] found dextro propoxyphene hydrochloride to be equal in potency with codeine phosphate without the undesirable property of tolerance development and occurrence of undesirable gastrointestinal side effects in his study of patients having chronic pain.

Side effects were experienced by a total of 490 patients, 275 of whom were given the mixture containing codeine, 117, the mixture with dextro propoxyphene and 98, the placebo.

■ *Summary and Conclusions*

Medication to produce analgesia was given 7,000 patients after oral surgical procedures. Identical capsules containing a mixture with codeine phosphate, a mixture with dextro propoxyphene hydrochloride, or a placebo were dispensed using a double blind technic. The severity of the surgical procedure was recorded as ranging from simple tooth extraction and tooth extraction with alveolectomy to removal of impacted teeth. The amount of medication taken during the first 24 postsurgical hours and the degree of analgesia were recorded. Side reactions also were tabulated.

Of the 645 patients who received the most severe surgical pain stimulus, 151 got complete relief from the mixture containing codeine phosphate (75.9 per cent of those receiving the preparation), 153 got complete relief from the mixture containing dextro propoxyphene hydrochloride (66.5 per cent of those receiving the preparation), and 106 got complete relief from the placebo (49.1 per cent of those receiving it).

Side reactions occurred in 490 patients, 275 of whom took the mixture containing codeine phosphate, compared to 117 patients taking the mixture containing dextro propoxyphene hydrochloride and 98 of those taking the placebo.

In comparable doses by weight, the mixture with codeine and the mixture with dextro propoxyphene were equally effective in producing analgesia after oral surgical procedures. The mixture containing codeine produced a significant number of undesirable side effects. Such reactions were observed much less frequently with a mixture containing dextro propoxyphene, which compared favorably with the placebo in this respect.—*123 Atlantic Avenue.*

1. Beecher, H. K. Powerful placebo. J.A.M.A. 159:1602 Dec. 24, 1955.

2. Keesling, Robert, and Keats, A. S. Efficiency of a placebo and several oral analgesics in the treatment of pain of alveolar osteitis. Oral Surg., Oral Med. & Oral Path. 11:736 July 1958.

3. Bross, I. J. D. How to use ridit analysis. Biometrics 14:18 March 1958.

4. Wolf, S., and Pinsky, R. H. Effects of placebo administration and occurrence of toxic reactions. J.A.M.A. 155:339 May 22, 1954.

5. Gruber, C. M., Jr. Codeine phosphate, propoxyphene hydrochloride, and placebo. J.A.M.A. 164:966 June 29, 1957.

Dental care planning in hospitals

■ *Fred A. Henny, D.D.S., Detroit*

A well staffed, well equipped dental department contributes much to the over-all care of both resident and ambulatory hospital patients. The hospital is also the proper atmosphere for the dental care of the physically and mentally handicapped. In addition, hospitals provide excellent facilities for formal graduate education in the dental specialties and should also function as centers for continuing education of dentists at the community level.

Any discussion of the philosophy of the practice of dentistry in hospitals must include the central theme that it is advantageous for the public to have a well-developed dental service in all hospitals that are large enough to be departmentalized. The advantages of this philosophy are not limited to conveniences for the patient by centralizing health care in one building. This, of course, is one distinct advantage, but there are many other areas which are related to health care that are also greatly benefited.

■ *In Dental Practice*

A clinical department of dentistry fits comfortably into the hospital organization primarily because it furnishes expert professional care in a vital area of the body which medicine does not include in either education or practice. Since dentistry has always been dedicated to the health problems of the mouth, jaws and associated

structures, as an organ system which contributes to oral and masticatory function, it is responsible for providing the health care for this particular portion of the body. In hospitals dental care should not be limited to oral surgery but instead should include all phases of dental care of the ambulatory and hospitalized patient. In addition to oral surgery and routine dental procedures, dental consultation can contribute greatly to the elimination of focal infection and treatment of oral problems that are associated with the patient's illness. Frequently the dental service can cooperate in solving the patient's primary reason for hospitalization. Patients who have physical or mental problems that require special knowledge and facilities can be cared for with maximum safety.

The obvious oral problems associated with hemophilia, blood dyscrasias, rheumatic heart disease, diabetes, Addison's disease, erythema multiforme, lichen planus, hypertension, metastatic and primary involvement of the jaws with malignant tumors, and the reconstruction of jaws that have been sacrificed by surgery are but a few of the problems that come within the purview of the dentist in the hospital and in which he can be of great benefit. Since many of these oral problems are not surgical in nature, it is important that such a hospital dental department be staffed with men who are well qualified in the specialties of dentistry. It has always been of interest to us in the Henry Ford Hospital to observe the part that the various dental specialties play daily in the cooperative management of medical or surgical problems.

Cleft lip and cleft palate patients require the assistance of the operative dentist, the prosthodontist, the pedodontist and frequently the periodontist in addition to that of the surgeon. Patients who have had a partial resection of the maxilla as a result of a disease process in either the maxillary mucosa or antrum are immediate postoperative cripples since they can neither speak nor eat properly because of the large defect which involves the oral, nasal and antral cavities. Adequate preoperative cooperation with the prosthetic section permits construction of a prosthetic appliance that can be inserted immediately after surgery, filling in the defect and sealing off the oral cavity from the nose and antrum. The patient then has the advantage of being able to communicate postoperatively and to take an adequate diet without a debilitating delay or prolonged use of a nasal gastric feeding tube.

In some instances, several specialties may have a vital interest in a single patient and contribute greatly to management of his condition. In a recent instance in our institution, the patient had considerable micrognathia which made it impossible for him to eat properly and produced facial disfigurement. Surgical correction of the deformity demanded a bilateral osteotomy through the mandible and a repositioning of the anterior jaw segments into a position of relatively normal occlusion. Preoperative preparation required the services of the department of roentgenology to provide an adequate roentgenographic survey, the operative dentistry section to repair several carious teeth, the periodontist to correct an incipient periodontitis, the orthodontist to construct the dental appliances that would be utilized postoperatively to stabi-

lize the fragments, and the dental intern to extract several teeth that were carious beyond repair or that would interfere with proper postoperative positioning of the mandible. In addition, the cooperation of the department of medicine was required for preoperative physical evaluation and the orthopedic section to provide bone from the bone bank to fill in the defect created by the osteotomy and repositioning of the jaws. The final surgery was done by an oral surgery team including senior staff and residents. Here, then, were eight individual spheres of professional interest that contributed to the final excellent result. This is a good example of the cooperative effort offered in the modern hospital with all personnel working together to produce the best possible result for the patient.

This may be viewed as a rather unusual example, but on the other hand it does emphasize the advantage of having experts available in the various specialties of dentistry. In a less spectacular way, everyday cooperation sees the periodontal section of the dental department managing the gingival problems that occur so commonly in diabetes, in epilepsy when diphenylhydantoin sodium therapy is utilized, in hemophilia, in the various types of leukemia, and in the vast majority of persons in the beyond middle age group who may or may not be in good health. At the same time, it is not unusual for the dental staff to make the initial diagnosis of untreated diabetes, since oral symptoms and clinical findings are occasionally the primary reason for a patient coming for care. The prosthetic section is active daily in rehabilitating edentulous patients or ones who have inadequate dentitions, assisting them to develop normal mastication and speech. They are also active, as mentioned previously, in the rehabilitation of patients with missing portions of the maxilla and in aiding in the treatment of the cleft lip and palate patient.

The pedodontic section is usually an extremely active service in caring for mentally, emotionally or physically handicapped children. The complete dental reconstruction of the mouth of such children under a single, safe endotracheal anesthesia, administered in the operating room by expertly trained anesthesiologists, has solved a problem that heretofore has been a completely insurmountable one for the patient, the family, the physician and the dentist. Adequate preoperative physical evaluation by the indicated medical personnel is, of course, essential to the safety and success of such procedures.

The operative dentist, being interested in the restoration of carious lesions of the teeth, in the treatment of teeth that can be safely retained by root canal therapy and in the construction of fixed bridgework, also contributes greatly to the care of the hospital patient. One of the operative dentist's greatest contributions in the future will be the routine care of the chronically ill who were estimated in a 1950 survey to number five and one half million people. This will be discussed later in more detail.

The oral surgery section, of course, has many inpatient obligations of its own. It can also contribute greatly by consultation and treatment in many varied medical and surgical areas. Elimination of focal infection is a major activity, but there are many additional problems involving the physiology and pathologic condition of

the oral cavity and its relation to systemic disease in which the oral surgery service can make a major contribution to patient care. In order to provide an efficient hospital service, the oral surgery section should maintain an outpatient clinic to provide proper physical facilities for diagnosis and minor surgery procedures under either local or general anesthesia when a major operating room environment is not required.

Thus it can be seen that a dental department is an important contribution to the adequate health care of patients. It must be realized, however, that this is a two-way street. In actual practice the various medical and surgical sections can also contribute greatly to the proper management of patients whose major reason for coming to the hospital is of a dental nature. It is, of course, impossible to divorce the oral cavity (and its function and pathology) from the remainder of the body. There are many medical problems that are either associated with dental disease or arise as complications in its management. Therefore, it is imperative that a good working relation exist between the various medical departments and each section of dentistry. Consultation should be provided cheerfully, readily and conscientiously by both physicians and dentists; thus all possible special knowledge can be utilized for the most effective management of the individual patient. It is especially in this area that much progress can be made in the development of effective interprofessional relations—with each profession recognizing the problems of the other and offering maximum cooperation to attain the best possible level of patient care. Dentistry can achieve this best by providing a complete hospital dental department of which oral surgery is a section, instead of limiting the dental efforts to oral surgery services alone.

■ *Qualifications for Dental Staff Appointments*

In large well-departmentalized hospitals, staff appointments are not a significant problem since there is usually an adequate number of well qualified dental specialists practicing in the immediate geographical area. In smaller communities, where there are very few, if any, dentists who have had graduate training, selection of a dental staff is a difficult problem for the hospital administration. It would therefore seem to be wise for the American Dental Association, the American Hospital Association and other interested agencies to study this problem and develop more specific standards for dental staff appointments. Ideally, all dentists on hospital staffs should have adequate graduate training. Unfortunately this is not possible at present, but it is hoped that with greater acceleration of graduate training programs in hospitals, this problem can be overcome.

In the interim, it might be possible for the American Dental Association and American Hospital Association to consider a program designed to stimulate hospitals and universities to develop postgraduate courses in hospital dentistry, primarily for the further education of dentists in small communities who must necessarily do some hospital work in their daily practice. Such dentists without graduate training, who desire staff appointments, should also be required to assist an established staff dentist for a prescribed period of time prior

to being given minor visiting privileges. This program should reduce the severity of the problem in small hospitals.

■ *Dental Internships and Residencies*

Hospitals are generally recognized as being the center of graduate training in medicine; hospitals also offer excellent opportunities for graduate study in dentistry. Although a significant number of graduate programs in dentistry have been operating in hospitals for many years and the number of such programs is steadily increasing, a great acceleration of this educational effort is needed. In my opinion, the next major advance in dental education would be the establishment of an internship requirement for licensure. This can have nothing but a beneficial effect on the quality of dental practice and, as a result, the public as well as the profession will benefit greatly. However, the number of internships and residencies is still far too small, and vigorous efforts will be required to achieve this very worthwhile goal. The cooperation of the armed services in this program would be of great value, since complete dental departments are already developed in most service hospitals and the quality of career dental personnel is very good and improving steadily. The services are, therefore, in an excellent position to provide great impetus to such a program by providing one year of intern training to a greater portion of the graduating dentists who enter the services for two years after graduation.

At present, several types of hospital graduate training are available for dentists. The first, of course, is the dental internship. It is composed of an intensive one-year experience in the hospital and usually is organized to provide a maximum amount of rotation and experience. Rotation should include clinical exposure in each of the dental specialties, anesthesia and the dental research laboratory. It is important for the intern to have basic instruction and experience in emergency care, including the early management of traumatic injuries of the jaws. Operating room experience should be sufficient to equip the trainee in the proper management of minor oral surgery procedures and the preoperative and postoperative evaluation of emergency patients. In addition, the training staff should participate in weekly seminars organized by the senior staff. A journal club for review of the pertinent literature at least once a month is a worthwhile educational activity. Seminars should embrace the specialties of dentistry and the pertinent aspects of medicine, including hematology, pathology, anesthesia, surgical principles, and internal medicine.

Following the dental internship, the trainee may go on to specialty training or in some instances may go on into general practice. Although this one year of graduate training is admittedly short in many respects, it does much to broaden and mature the dentist and to ensure the quality of his care of patients in future practice.

Residencies are currently offered in oral surgery, oral pathology, children's dentistry and periodontics. This period of additional study is designed to equip the student for the care of patients in his field of special interest. To become board certified, the oral surgeon must take one year of basic science study at the graduate level

in addition to at least two years of formal hospital training, which must include thorough training in general anesthesia. The residencies in the other dental specialties are usually for two or three years, depending on whether or not the trainee incorporates formal graduate study sufficient to qualify for a Master's degree.

Dentistry is continually re-evaluating the graduate programs in the specialties in an effort to add to and strengthen the educational background of the trainee. The American Society of Oral Surgeons sponsored one planning conference on graduate study in oral surgery in 1958 and has another one scheduled. It is encouraging to note that tangible results are already apparent. It should again be emphasized that in my opinion the next significant advance in dental education will be universal graduate training.

■ *Continuing Education in Dentistry*

Up to this point only formal graduate dental education in the hospitals of the future has been discussed. However, it should be remembered that the dental departments of hospitals can contribute greatly to the continuing education of the dentists of the community by sponsoring regular postgraduate seminars and conferences. Since it is hoped that dental departments eventually will include all specialties of dentistry and that the men in these positions will not only be well qualified but will be stimulated continually by the hospital atmosphere to expand their education, it follows that they should be well qualified to organize and conduct seminars and conferences which in turn will contribute to the educational background of the dentists practicing in the surrounding community. Again this can have nothing but a beneficial effect on the quality of dental practice.

■ *Dental Service for the Handicapped and Needy*

As stated previously, there are in excess of five and one half million chronically ill persons in the United States at the present time, and this number probably will increase with the current national trend toward longer life. Included in this group are cardiac, orthopedic, arthritic and paralytic invalids, the mentally retarded and mentally ill, patients with cerebral palsy, cancer and tuberculosis, plus a large number of people who are going through the so-called normal physiological changes of advanced age. The recent rapid improvement in the medical management of acute illness has allowed many people to survive and live on in a chronically ill state under delicate and sometimes precarious medical control.

It must be admitted immediately that this large segment of the population does have a dental problem and also that it is not receiving adequate treatment. Something definite should be done in the way of planning an over-all dental program for these people, a program that should be activated as promptly as possible, since the number of patients is increasing constantly and their oral health degenerating. The dental profession has given much thought to this matter and it has been proposed by some that new dental technics and services be developed to bring the dental care to the bedside of the chronically ill patient, be he institutionalized or confined to his home. I cannot

foresee how this type of program can possibly work to any degree of satisfaction. The end result would inevitably be poor quality of care, increased risk, a great loss of efficiency and waste of dental manpower, and therefore inadequate coverage and failure to solve the problem. The only real answer to this problem is the development of complete dental departments in hospitals, properly staffed and equipped, so that the patient can be brought to such a facility for proper, efficient care. Modern dental methods and equipment allow rapid, safe solution of such problems in an atmosphere that carries with it high standards and maximum protection of patients that are already known to be handicapped and are frequently classified as poor risks. Certainly the risk cannot be reduced nor efficiency increased by administering makeshift dental care at the bedside with time-consuming, inadequate and cumbersome methods. Risk can be kept at a minimum and efficiency at a maximum by providing adequate dental care in a properly equipped, properly staffed hospital dental department. Very few patients cannot be moved safely. Many are already confined to a hospital. Those who are at home usually can be moved by car to the proper facility without great difficulty.

The same basic principles apply to the care of the needy. Properly sponsored assistance programs can be integrated with ease into hospital dental programs where superior work can be done with efficiency and dispatch. The cost of dentistry is not reduced by having poor facilities, poor equipment and inadequately trained personnel. It can be reduced only by the use of the most modern methods and equipment by personnel who are keenly aware of the advances that are taking place in their sphere of professional interest. The steadily increasing cost of materials, equipment and personnel can be met only by increased knowledge and efficiency which in turn can be achieved best by provision of proper facilities and a great acceleration of graduate dental education in hospitals.

■ *Dental Health Education for Nurses*

Unfortunately, the majority of nurses graduate without even a basic knowledge of dentistry. This is, indeed, unfortunate for they have many opportunities to be useful to their patients if they possess some background in dentistry. It is advisable, therefore, for the dental staff to organize a relatively simple, concise course to present as a regular part of the nursing school curriculum. The New Jersey State Dental Association has been singularly active in this regard and at the present time is providing courses in the essentials of dentistry for most of the schools of nursing in their state. The few schools that do not include them are planning on getting a dental program under way within the next two years. This particular effort includes six one-hour lectures and is designed to give the students a basic background in the anatomy, physiology, pathology and hygiene of the oral cavity. This is a contribution that dentistry is willing and able to make to improve health care. Properly implemented, it will have a very beneficial long-term effect.

■ *Dental Research Programs in Hospitals*

With the acceleration of dental research sponsored by the National Insti-

tutes of Health and other government and private agencies and foundations, it is now possible to organize and finance adequate dental research units in hospitals. This is an excellent atmosphere for dental research for it encourages close association and free interchange of information between the dental, medical and hospital research staffs and the personnel of the dental research unit. We have had such a section in the Henry Ford Hospital for the past two years, and it has already contributed greatly to the educational balance of the dental department as well as of many other members of the hospital staff. Clinical problems frequently stimulate interests that can be satisfied only by laboratory investigation. As an example, we have been interested for a long time in the strong correlation between alcoholism, inadequate diet, impairment of liver function, and cancer of the mouth that we have observed in our patients. Currently we are trying to duplicate this experience in laboratory animals and then to locate the possible nutritional or hormonal additive which will preserve the health of the mucous membrane and render it more resistant to malignant degeneration. Another of our clinical studies has shown a strong correlation between developmental defects of the dental enamel and the subsequent development of epilepsy. Laboratory investigation in the dental research laboratory is now clearly showing the role of prenatal and neonatal factors in the formation of enamel hypoplasia which may possibly result in a reappraisal of obstetrical care and subsequent reduction of not only enamel defects but also the occurrence of epilepsy. This is an excellent example of medical and dental personnel working together, pooling their knowledge, to provide a major contribution to health care.

Dental research activities are also useful in the graduate training program, for they allow the assignment of a specific research project to each resident to be completed during his residency, thus forcing him into the discipline of research which is not only stimulating to him but also of importance in his development as a solidly professional man. It is hoped that there will be growing interest in dental research in hospitals, for significant progress in the investigation of many problems of mutual interest can be attained by pooling dental and medical knowledge.

■ *Summary*

1. The development of well equipped, well staffed dental departments in hospitals is of considerable importance in the field of health care.

2. The dental staff preferably should include all recognized dental specialties if it is to provide proper consultation and good quality, effective dental care.

3. Appointments to the dental staff should be based on adequate graduate training and experience. More definite regulations should be developed for staff appointments.

4. The dental service is helpful in consultation, diagnosis and treatment of many associated medical and dental problems. Its contribution can only result in improved treatment of patients and steady development of effective medical-dental relations.

5. Graduate training in dentistry should be greatly accelerated. Institution of an internship requirement for dental licensure would constitute a major advance in dental education and result in considerable improvement of dental care.

6. The hospital is a proper atmosphere for the development of continuing education programs in dentistry. Such programs should be developed primarily to assist in the continuing education of dentists in the surrounding community.

7. The hospital dental clinic is the proper facility for care of the increased risk, handicapped or chronically ill patient. Patients should be transported to such clinics for care under conditions which provide maximum efficiency and safety.

8. Dentistry should provide elementary courses in dentistry for schools of nursing and for graduate nurses who do not possess this background.

9. Hospital dental departments should be stimulated to develop research units for the investigation of oral diseases and those medical problems that have oral manifestations. A cooperative effort provides an exceptional opportunity for fruitful research.

10. Dentistry stands ready to improve patient care but will require the cooperation of medicine and of hospitals to achieve this goal.

Presented before the Committee on Hospital Planning, American Hospital Association, Chicago, January 26, 1959.

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■ Taste Sensitivity and Senescence

A sipping technic was used to test 100 subjects, aged from 15 to 89, for taste sensitivity to substances with sweet, sour, salty or bitter properties. It was established that the curves of development and decline for sensitivity to each of the four taste primaries were almost identical. All curves showed a noticeable decline in patients older than 50 years. No sex differences were observed. The decreasing sensitivity to taste during senescence is probably caused by certain degenerative changes occurring in the taste receptors. The gustatory papillae reach full development at puberty, and the first symptoms of regression in taste sensitivity appear after the age of 45 years in the form of a decrease in the number of gustatory papillae and in number of the taste buds. In young adults there are approximately 250 taste buds in each circumvallate papilla; in persons older than 70 there are less than 100.—*R. M. Cooper, L. Bilash and J. P. Zubeck, Journal of Gerontology, January 1959.*

Paresthesia: evaluation of 16 cases

■ *Victor H. Frank, D.D.S., Philadelphia*

Close proximity of the root apexes of impacted third molars to the mandibular canal influenced the incidence of paresthesia. Suggestions are offered to reduce the incidence of paresthesia. Further study of this complication is indicated.

A desire to discover the frequency of occurrence of paresthesia and its duration with a view to reducing such occurrence prompted this survey. Only lower third molars, practically all of them impacted, whose root apexes were 2 mm. or less from the mandibular canal, were included in the study. This survey covers 300 extractions of lower third molars. Among the 300, there were 16 instances of paresthesia occurring after the surgical removal of the teeth.

In the interests of the profession, these observations are presented in the hope that they will stimulate others to make a like study which might help to ameliorate the incidence.

In order to make comparisons possible, all the operations were performed by the author.

A few articles have appeared in the literature which alert the dentist to the dangers and suggest warning the patient of the possibility of paresthesia. However, no oral surgeon has actually cited instances from his own practice. By presenting the observations herein recorded, the following may be accomplished:

1. Other men may be stimulated to present their own figures showing the incidence of paresthesia.
2. Significant data can be recorded, according to technic used, relative to the distance of the tooth apex from the mandibular canal.
3. More figures will be available on the duration of paresthesia.

H. E. Simpson,[1] in his article on injuries to the inferior dental and mental nerves, stated:

> Of 50 patients with nerve injury . . . considered collectively, 22 of the patients still suffered from a considerable degree of disability at the end of six months, and . . . it would appear that the chance of further improvement is slight. Sixteen of the patients were followed for an additional six months. Only one recovered during that time. Eight patients have been observed for five or more years. None of these has recovered.

Table 1
Classification of extractions by technic

Technic	No. of extractions	% of total	Instances of paresthesia	
			No.	%
Ossisector (main technic)	67	22.7	1	1.5
Ossisector alone	51	17	1	2
Ossisector & chisel	14	5	0	0
Ossisector; tooth sectioned	2	0.7	0	0
Chisel (main technic)	231	77	13	5.6
Chisel (bone cut)	167	55	3	1.8
Chisel (tooth sectioned)	64	21	10	15.6
Forceps (unusual cases)	2	0.7	2	100

Cameron[2] stated:

> A lower third molar . . . may be malposed and impacted to the extent of impinging on the mandibular canal. . . . Prior to removal of a tooth in this position, the patient should be advised carefully that anesthesia of the lip may follow the operation no matter how skillfully the removal is executed. The numbness may last for several weeks or months or even longer, and the patient should be informed that no one can state how long it will persist.

■ *Observations*

Table 1 classifies the 300 extractions according to the technic used and the incidence of paresthesia. Conclusions cannot be drawn from these figures regarding the relative efficiency of the two principal technics. Rather, an explanation will be given of the procedure used and the reasons therefor.

By and large, the hand chisels (ossisectors) were used in instances where there was little bone to be removed or in younger patients in whom the bone was easier to cut.

When the chisel and mallet technic was used, it was determined whether it was wise to remove bone first and then remove the tooth in toto, or whether the tooth should be sectioned after very little bone had been removed. Naturally, the teeth which had to be sectioned were the more difficult impactions.

This paper is not intended to discuss technic; the short explanation is given so that the technic and the figures can be evaluated in proper perspective.

Table 2 shows the incidence of paresthesia in relation to the distance of the root apexes from the mandibular canal. In a significant number—namely, in 48 teeth—where the roots were 2 mm. from the canal, no paresthesia occurred. In 29 teeth in which the apexes were 1 mm.

Table 2
Classification by location of apex in relation to canal

Position of root apex	No. of extractions	%	Instances of paresthesia	
			No.	%
2 mm. above canal	48	16.3	0	0
1 mm. above canal	29	9.6	1	3.4
On canal	183	61.0	9	4.9
Below canal	40	13.0	6	15.0
Total	300	100.0	16	

from the canal, there was only one instance. Where roentgenograms showed the canal superimposed on the roots, the incidence rises to the alarming figure of 15 per cent. Even when the roots were not in contact, lateral pressure surely could affect the canal contents.

Naturally, knowing this potential danger, special surgical care was taken to minimize the possibility of nerve injury. (The occurrence when forceps was used will be discussed separately.) In order to make this survey as accurate as possible, all lower third molars where the roots were within 2 mm. of the canal were listed.

The problems involved in the two instances in which forceps was used were as follows:

1. A curved distal root which fractured and was teased out with a fine pointed elevator.

2. A tooth with sharp curvature of the roots which was removed in its entirety with forceps, without fracture. However, this tooth was "rocked" and the lateral pressure on the canal must be held responsible for the paresthesia.

Table 3 summarizes the duration of paresthesia. Of 16 patients, 14 have been checked accurately. It was impossible to contact the remaining two patients. Only one patient (in this instance the root was 1 mm. above the canal) recovered in less than one month. Four patients recovered in a one to three month period; six recovered in the three to six month period, and one in eight months.

Two patients still have a very slight paresthesia after 18 and 21 months respectively. (It might be mentioned here that in my prior experience there have been several patients with paresthesia who have never recovered sensation.)

■ *Report of Cases*

A brief résumé of the instances in which paresthesia occurred is as follows (Fig. 1-16).

Case 1. Woman. In an erupted third molar, the roots of which were on the mandibular canal, the distal root fractured

Table 3

Duration of paresthesia

Case No.	Sex	Technic	Position of apex	Less than 1 month	1–3 mos.	3–6 mos.	Longer	Still present
1	F	Forceps	on canal		53 days			
2	F	Ch. & S.	on canal					
3	M	Ch. & S.	on canal					21 mos.
4	F	Ch. & S.	on canal		41 days			
5	F	Ch. & S.	on canal					18 mos.
6	F	Ch. & S.	below canal					
7	F	Ch.	1 mm. above	11 days				
8	F	Ch.	below canal			4 mos.		
9	F	O.	on canal			6 mos.		
10	M	Ch. & S.	on canal				8 mos.	
11	F	Ch. & S.	on canal			6 mos.		
12	F	Ch. & S.	below canal			5 mos.		
13	F	Ch. & S.	on canal			6 mos.		
14	M	Ch. & S.	below canal			4 mos.		
15	F	Forceps	below canal		2 mos.			
16	F	Ch.	below canal		3 mos.			
				1	4	6	1	2

Ch. & S.: chisel; tooth sectioned Ch.: chisel O: ossisector

and had to be teased out with elevators. Paresthesia lasted 53 days.

Case 2. Woman. This patient's tooth, which had roots on the canal, was sectioned and paresthesia resulted. The patient could not be contacted to learn duration.

Case 3. Man. This patient's tooth, which had roots on the canal, was sectioned. Paresthesia resulted. Twenty-one months later, slight paresthesia still is present.

Case 4. Woman. The position of the tooth was the same as in Cases 2 and 3. Paresthesia lasted 41 days.

Case 5. Woman. Position of tooth was the same as in Cases 2, 3 and 4. Slight paresthesia is still present after 18 months.

Case 6. Woman. The tooth, with roots below the canal, was sectioned. This patient could not be contacted.

Case 7. Woman. The roots were 1 mm. above the canal in this instance. Chisel and mallet were used to cut bone. Paresthesia lasted 11 days.

Case 8. Woman. The roots of this tooth were below the canal. Chisel and mallet were used to cut bone. The tooth was rotated with roots buccally and lingually. Paresthesia lasted four months.

Case 9. Woman. The roots of this tooth were on the canal. An ossisector was used. Paresthesia lasted six months.

Case 10. Man. The roots of this tooth were on the canal; tooth was sectioned. Paresthesia lasted eight months.

Case 11. Woman. In this instance, the roots were on the canal and the tooth was sectioned. Paresthesia lasted six months.

Case 12. Woman. The roots of this tooth were below the canal. Tooth was sectioned. Paresthesia lasted five months.

Case 13. Woman. The roots of the tooth were on the canal. Tooth was sectioned. During the process, an elevator broke. Paresthesia lasted six months.

Case 14. Man. In this tooth, the roots were below the canal. Tooth was sectioned. Paresthesia lasted four months.

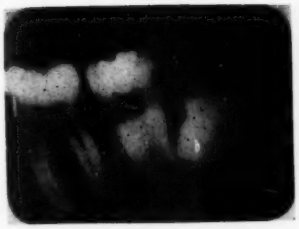
Case 15. Woman. The roots of this tooth were below the canal. Forceps were used because the crown was exposed. Paresthesia lasted two months.

Case 16. Woman. The roots were below the canal. Chisel and mallet were used to cut bone. Paresthesia lasted three months.

DISTRIBUTION ACCORDING TO SEX—Table 4 lists the operations according to the sex of the patients. The figures, 3 men to 13 women, may or may not be important. I would estimate that women account for about 60 per cent of our practice. In this study, the precentage of women

Case 1

Case 1



Case 2

Case 3

Case 4

Case 5

Case 6

Case 7

Case 8

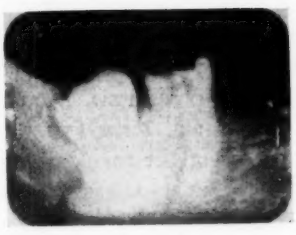
Case 9

Case 10

Case 11

Case 12

Case 13



Case 14

Case 15

Case 16

Table 4
Classification by sex

Method	Men		Women	
	No. of cases	Instances of paresthesia	No. of cases	Instances of paresthesia
Ossisector	18		33	1
Ossisector & chisel	5		9	
Ossisector; tooth sectioned	1		1	
Chisel	44		123	3
Chisel; tooth sectioned	30	3	34	7
Forceps			2	2
Total	98	3	202	13
Total percentage	33%		67%	
Paresthesia percentage		19%		81%

to men was 67 per cent to 33 per cent (212 women, 98 men). Of the instances in which paresthesia occurred, 81 per cent were in women and 19 per cent were in men (13 women to 3 men).

The differences, namely 81 per cent as against 67 per cent, must be evaluated to determine if the incidence is higher in women. Here too, additional figures and data from other investigators would be invaluable.

■ *Comment*

The results of this study indicate that prevention is most important. In the series presented, no definitive steps were taken toward possible cure, unless therapeutic drugs and agents can be counted in this category.

My observations regarding prevention are as follows:

1. Surgical care is of prime importance in all instances, particularly if roentgenograms show the mandibular canal to be in the same plane as or below the canal.

2. In cutting bone or sectioning teeth, the force should never be in a direct line with the canal. In sectioning teeth, the force may be directed slightly from the buccal aspect.

3. Should lower third molars break and it is necessary to probe for roots, extreme care should be taken not to force elevators or root instruments "blindly" in the direction of the canal.

4. When forceps is used in instances where the canal is lateral to the roots of the tooth, extreme care should be taken not to "rock" the tooth laterally. Gently releasing the tooth within its bony socket with a suitable instrument is the safer procedure.

5. I heartily endorse Fred Henny's suggestion that children should have their impacted third molar teeth removed before the roots are fully formed. This study indicates that it is good judgment to remove impacted teeth while their roots are well away from the mandibular canal.

6. Meticulous records should be kept of instances of paresthesia. Merely keeping the records will serve to make dentists more aware of the problem and they will be in a position to make their own comparisons. I have varied my own

technic slightly since this study was begun.

Paresthesia is a problem that oral surgeons too frequently have ignored; also, it is one for which there is no easy cure. Therefore, prevention should be emphasized and the dentists should face the problem honestly. If this is done, younger men will not feel inferior when paresthesia occurs in their patients. An exchange of information regarding occurrence would be healthy for the profession and good for the patients.—*1800 Pine Street.*

1. Simpson, H. E. Injuries to inferior dental and mental nerves. J. Oral Surg. 16:300 July 1958.
2. Cameron, J. R. Management of impacted teeth. J. Oral Surg. 16:93 March 1958.

Disinfection, antibiosis and sterilization in modern dentistry

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A clarification of the terms of disinfection, antibiosis and sterilization is made. The factors which influence chemical disinfection and a classification of the mode of action of chemical or "cold" disinfectants are discussed. Various chemical disinfectants are mentioned in relation to the author's classification. The ultimate conclusion is that heat sterilization, wherever possible, is more efficient than chemical disinfectants, for in the author's words, "the ideal disinfectant has not yet been devised."

The recent awareness of the modern lay press regarding the activities of medicine and dentistry has led to the popularization of the newer developments in these fields. The eagerness with which the lay writer has culled and discussed the latest reports in the scientific journals has caused the public to press the practitioner for the latest medicaments before they have had seasoned laboratory and clinical trials. The demand for newer antimicrobial drugs, preventatives and therapeutic agents has produced the premature demand for tomorrow's medicine today. This demand is reflected in the pseudo-scientific experiments designed for the lay advertisement of various products, especially those concerned with disinfection and sterilization. In addition, the misuse of some of the well recognized terms has occurred for so long a time that clarification is in order.

A discussion of principles and developments in disinfection and antibiosis

should be preceded by a definition of terms. The word "sterilization" implies the killing or complete removal of all forms of microbial life, whether accomplished by physical or chemical means. Among the chemicals are compounds that have germicidal activity, and these are capable of killing all microbial life whether they are in the growing vegetative state or in the dormant spore stage. Other compounds have a more limited action and are called "disinfectants," which by definition means that they kill pathogenic microorganisms, but not all germ life. This latter term is defined as synonymous with "antiseptic." However, an antiseptic is often defined loosely as a substance which prevents decay or putrefaction, thus acting to supress or inhibit the growth of microorganisms rather than to destroy them. This word is used synonymously with the terms "bacteriostatic" and "preservative," even though bacteriostatic implies the broader concept of prevention of growth of all bacteria, whereas antiseptic refers only to the infectious bacteria, and the term preservative is applied to chemicals used in food or in the prevention of contamination or spoilage of biologicals.

■ *Chemotherapeutic Agents*

Substances used in the treatment or prevention of infections are referred to as "chemotherapeutic agents" which include compounds of a synthetic nature (such as sulfonamides, arsenicals, and mercurials) and those of biological origin such as quinine and penicillin. Although the use of chemotherapeutic agents in the treatment of disease dates back to the use of mercury by the Arabic physicians and cinchona by the Peruvian Indians, it did not develop a sound basis until the development of the arsenical arsphenamine for the treatment of syphilis by Ehrlich in 1909. This discovery of the "magic bullet" opened a new era in the use of specific drugs for the treatment of disease. The development of this new field lagged until 1935 when Domagk reported that the compound sulfamidochrysodine (a red dye called Prontosil) would cure streptococcal infections of mice. This therapeutic effect was demonstrable in the animal body, but apparently had little effect on bacteria in cultures. This was later found to be due to the fact that in the body Prontosil was broken down with the resultant release of para-aminobenzene sulfonamide which acted as an antimetabolite, interfering with the microorganism's normal utilization of para-amino benzoic acid in its metabolism. This advance in therapeutics opened the "sulfonamide drug" era which has led to the development of hundreds of substituted sulfonamides of varying solubility and antibacterial specificity. As in the case of the original sulfanilamide, these compounds are primarily of the bacteriostatic variety, exerting most of their action as antimetabolites after they have been absorbed into the body.

A second group of chemotherapeutic agents finally reached usefulness with the discovery of penicillin by Fleming in 1929. The principle of antibiosis had long been recognized since the report of Pasteur in 1877 that contamination of his anthrax cultures by *Pseudomonas aeruginosa* caused them to lose their ability to produce infections in animals. It was found that the products of metabolism of some forms of microbial life are harm-

ful to other bacteria, and these substances have been named "antibiotics." Since the discovery of penicillin there have been scores of antibiotics described and produced for use in treatment of infectious diseases. Most of these have been obtained from molds, bacteria, and higher bacteria of the *Streptomyces* group. Unfortunately, many of the antibiotics are not only toxic to bacteria, but they are also toxic to humans, thus limiting their usefulness. However, a number of antibiotics have little or no toxicity, whereas others have harmful qualities of a low order which permits their judicial use in proper concentration in selected cases. Many of these antibiotics have a wide spectrum of activity, but none have been found so far that affect all bacteria. Most antibiotics exert a bacteriostatic effect whereas some show bactericidal qualities when used in sufficient concentration.

With the development of these new therapeutic agents, new testing technics were devised to test the sensitivity of the bacterial invaders to the many antibiotics available. With these testing methods, the clinician may select the antibiotic of choice for the treatment of his particular patient rather than guess which available therapeutic agent might be desirable. This has led to the scientific selection of antimicrobial drugs in the treatment of disease. These methods of medicine are also applicable to the infections found in dentistry.

■ *Disinfectants*

The rapid advances in the field of chemotherapy have been matched by notable progress in the development of new disinfectants and other antimicrobial chemicals. Although these have been considerable with relation to types of compounds, and their activity, the basic factors which influenced the older antibacterial agents also govern the activity of the new disinfectants.

Factors which influence chemical disinfection are as follows:

1. The inhibition or killing of microbial life is directly dependent on the concentration of the compound being used. If the agent is too dilute, it may produce no desirable results, and if too concentrated, the effect produced may either be undesirable or possibly its use is impractical. This has been presented as a "disinfectant spectrum" by many authors. Dilution of the concentrated compound can move its activity from the toxic or impractical zone to the zone of germicidal effect. Further dilution may shift its activity from the germicidal to the zone of inhibition; however, this zone is not sharply divided because the various microbes do not react to all germicides in the same way. To accomplish a killing effect, one organism may require several times as much disinfectant as another. This is especially true when spores are compared with vegetative cells. As dilution is continued, the action enters the zone of inhibition of growth, which is due in many cases to an interference with enzyme activity. Thus by dilution alone, a germicide can be reduced to the status of a bacteriostatic compound. On further dilution the compound may lose its antibacterial qualities entirely and become ineffective. In many instances it is possible to demonstrate that as the dilution reduces the antimicrobial action, a zone

of stimulation occurs. In this concentration the chemical acts as a stimulant to bacterial growth rather than as an inhibitor. In none of these zones is there a sharp line of separation, and furthermore, the size of the zones varies with each organism being studied. As would be expected, continued dilution of the compound finally so weakens the active ingredient that no effect can be observed when this is used as an antibacterial treatment.

2. A second factor that exerts a profound influence on germicidal action is the time of exposure of the organisms to the chemical. Death of bacteria is not a sudden affair; the number of survivors in a culture is a measurable gradual process. In general, the numbers dying at any given time of exposure is a constant fraction of the number that were viable at the beginning. Thus, the rate of death is proportional to the number of living bacteria present and the killing effect is a gradual and progressive process which reaches completion in time.

It should be noted that time and concentration are interdependent. For example, the time required for the killing effect decreases with an increase in concentration, and the time needed increases with a lessening of the concentration.

3. A third influence on disinfection by chemical means is the effect of temperature. As the temperature is raised, the rate of death is increased. For example, it has been shown that for every 10° rise in temperature, the bactericidal quality of carbolic acid against *Salmonella paratyphi* is increased two to four times. This catalytic effect of temperature on the rate of death has been referred to as the "temperature coefficient." As the temperature is raised it soon approaches that point at which the killing effect observed is not only due to heat catalysis of the disinfectant action, but also the coagulation of the bacterial protoplasm by heat itself is beginning to appear as part of this picture. Thus, as the temperature approaches 50 to 60° C., the effect of heat as a killing agent is intermingled with the effect of the chemical involved.

4. As a fourth influence on chemical disinfection, the nature of the medium in which the disinfectant acts might be considered. The presence of water in the medium acts to promote killing, as water is a vehicle for transport of substances into and out of the bacterial cell. In addition, the coagulation of microbial protoplasm is aided by the presence of water. The pH of the medium frequently affects disinfection. It has long been recognized that the effectiveness of chlorine is lost in alkaline solutions. The presence of certain electrolytes may interfere with some disinfectants; for example, chloride ions interfere with the dissociation of mercuric chloride, thus suppressing the concentration of free mercury ions and reducing the killing effect of the solution. In addition, a most important factor in the nature of the medium is the presence of protein. Many of the commonly used disinfectants are reduced in their effectiveness by the presence of serum or other proteins. For example, the following are so affected: hexachlorophene, bithionol, phenol, mercurials, nascent oxygen and perborate compounds. In the case of the quaternary ammonium compounds such as benzalkonium chloride and benzethonium chloride, the presence of soap is known to reduce their germicidal action.

The influence of the medium to be sterilized has a noticeable effect on the compounds to be used in disinfection, and it might be concluded that the ideal disinfectant has not yet been devised. The characteristics of the ideal chemical disinfectant have been listed by C. E. Clifton as:

1. Active in low dilution.
2. Low tissue toxicity, if employed as an antiseptic.
3. Freedom from undue species specificity.
4. Efficient in the presence of organic matter.
5. Low coefficient of dilution.
6. Low temperature coefficient.
7. High power of penetration, that is, low surface tension.
8. Rapid action, a high K value.
9. Sufficiently soluble, stable and homogenous.
10. Chemical compatability, that is, lack of corrosive action.
11. Low cost.

The mode of action of chemical or "cold" disinfecting agents may be classified as follows:

1. Hydrolysis of cellular material. This effect is accomplished by strong acids and alkalis. The mineral acids, such as sulfuric, nitric and hydrochloric acid, act in proportion to their ionization as killing agents. In the case of the alkalis, the concentration of the hydroxyl ions in solution governs the lethal effect. In both, the end result is hydrolysis of the bacterial protoplasm and dissolution of the cell. Sodium hydroxide, which is easily obtainable as household lye, may be used in a 5 per cent solution to disinfect. When quicklime is dissolved in water it forms slaked lime ($Ca(OH)_2$) which is also a good bactericidal agent, acting by hydrolysis. In the case of weak acids or alkalis, the antibacterial effect is usually a bacteriostatic one when the pH is shifted to an undesirable point for the microorganism, thus interfering with its enzyme systems.

2. Mechanical disruption. Ordinarily this type of destruction is accomplished by the grinding effect of a ball mill or the disintegrating effects of supersonic vibration. In the case of chemical disinfection, plasmolysis of cells may be accomplished by the osmotic changes brought about by strong sugar and salt solutions.

3. Antiseptic dyes. A number of the dyes of the aniline and other types have exhibited a selective action on bacteria. This effect has long been recognized, and the phenomenon has been used in culture media to inhibit certain bacteria, thereby allowing others which are unaffected to grow. For example, eosin and methylene blue were used by Levine in making a medium that would allow the coliform and noncoliform intestinal gram-negative rods to grow while inhibiting the gram-positive organisms. The antiseptic and bacteriostatic dyes have been used as therapeutic agents. The acridine dyes such as acriflavine, proflavine, acridine and typaflavine have been used to treat disease as well as prevent infections of exposed tissues. The rosaniline group (methyl violet, gentian violet, malachite green) has enjoyed wide usage in the prevention and treatment of infections. In fact, gentian violet is often used to treat mycotic diseases such as thrush and

worm infestations such as pinworms. It is also used to treat wounds infected with gram-positive organisms. The dyes of the azo group (trypan blue, Bismarck brown, Congo red) have more limited use and have not been of importance in the treatment of infections. In general, the bacteriostatic and antiseptic dyes have a limited usefulness in dentistry.

4. Gaseous agents of disinfection. For many years gaseous formaldehyde, sulfur dioxide, chlorine and hydrogen cyanide have been used to disinfect rooms that had been occupied by patients having contagious diseases. The use of such agents has declined in the past years. However, with the advent of plastics and other materials that have use in medicine and dentistry, a means of terminal disinfection other than by heat came into demand. This has been met by the alkylating agents such as ethylene oxide, ethylene amine and methyl bromide. These compounds when used as gases have been unusually successful in killing spores as well as vegetative bacterial cells. The studies on ethylene oxide show that their use must be carried out with care as the gas is explosive and therefore not applicable as yet to office practice.

5. Oxidizing agents. The most common oxidizing agents are the halogens such as chlorine, bromine and iodine. These act as oxidizing agents and are very potent. Chlorine may be used in the form of sodium and calcium hypochlorite, chlorox, Dakins' solution, chloramine-T, liquid chlorine and chloroazodin. The iodine preparations have had many uses in disinfection. These have been used as a tincture (7.5 per cent iodine in 70 per cent alcohol), Lugol's solution, iodoform, thymol iodide and iodine complexes. The bromine and fluorine compounds have had limited usefulness. In addition to the compounds which oxidize, those that release oxygen are of importance in dentistry. These include sodium perborate, zinc peroxide, benzoyl peroxide and hydrogen peroxide.

6. Phenolic and related compounds. Since Lister used phenol (carbolic acid) for antiseptic surgery, phenols and phenolic compounds have been broadly applied as disinfection and sterilization agents. In addition, phenol is used as the standard for comparison with other disinfectants. In dilute solution, phenol acts on essential enzyme systems of bacteria and the higher concentrations disrupt the cell wall and precipitate the protoplasm in the manner caused by strong acids. Unlike many other disinfectants, organic matter has little influence on the antibacterial effects of phenol. However, because of the definite toxicity of phenol for tissues, it is rarely used internally. Similar compounds such as hydroxyphenol (resorcinol) has minimal toxicity but its action is neutralized by the presence of organic substances. For this reason the excellent antibacterial action of resorcinol has limited use. The cresols have greater antibacterial activity with less tissue toxicity, but because of their insolubility they have been limited to cleansing agents.

Derivatives of phenol have shown excellent possibilities in the field of disinfection. The germicidal activity of phenol increases as the molecular weight increases from a phenol coefficient of 1 for simple phenol to a coefficient of approximately 16-18 for the 4-n-amyl homo-

logue of phenol. Further increases in molecular weight show considerable rise in the phenol coefficient up to 313-389 against such organisms as *Staphylococcus aureus, Candida albicans* and *Mycobacterium tuberculosis* whereas the effectiveness for *Salmonella typhosa* was only 33. Further potentiation of the antibacterial qualities of these compounds is brought about by halogenation. The addition of chlorine to the molecule intensifies the bactericidal activity. However, there is a point at which the molecule ceases to tolerate substitution and yet retain its killing effect. A number of compounds of the halogenated phenol derivatives are available in the form of 0-syl, Lysol and Amphyl. It is important to note that compounds of this type are adsorbed by some of the newly developed plastics. The polyethylene plastic containers and some of the plastic "gauze" sponges will remove Amphyl from solution. Therefore plastic containers, flats and sponges should not be used with these disinfectants.

7. The bis-phenols. These compounds are composed of two phenol rings attached by various linkages which have distinct antibacterial and antifungal effects. As was found with the phenol derivates, the addition of chlorine to the phenol rings increased this bactericidal action. Some of these, like dichlorophene, were most useful as antimildew agents, while hexachlorophene was used as an additive for soap to be used to disinfect skin. A 1 per cent solution has been used in the disinfection of instruments. This compound, however, does not kill *Mycobacterium tuberculosis*. Further developments of this group of chemicals is in progress.

8. The quaternary ammonium compounds. These cationic surface active agents have bactericidal capabilities and have been used as disinfecting solutions. The more commonly used members of this group are Zephiran, Phemerol, Ceepryn and Cetab. Unlike the bis-phenol group, the bactericidal action of these agents is interfered with by soaps and fatty materials. Consequently, instruments to be disinfected by these should be washed and rinsed before immersion into the quaternary ammonium compounds. The best results occur with the gram-positive nonspore formers, whereas the action against gram-negative rods of the coliform and noncoliform types is weaker. The mode of action of this group of compounds is under study and the data now available indicate that its main action is that of an enzyme inhibitor affecting the respiratory, glycolytic and oxidative enzymes. It is of importance to note that a large number of chemicals are incompatible with this group of compounds. This list includes soaps, Argyrol, Pantopon, peroxides, chromates, potassium iodide, salicylates, silver nitrate, zinc oxide and sodium sulfathiazole.

9. Salts of heavy metals. Compounds containing mercury are among the oldest of disinfecting agents, being used first by the early Arabian physicians to prevent sepsis. For some time it was thought that mercuric bichloride was a bactericidal compound that could destroy spores. Recently, however, it has been shown that mercurials in the concentrations recommended for use do not kill spores, and their main action is that of a bacteriostatic agent. Their action is due to the toxicity of the metal ion for enzyme systems and metab-

olites as well as their ability to coagulate protein. One serious limitation for these compounds is that they can be neutralized by hydrogen sulfide or compounds having SH-radicals such as contained in the amino-acids, cysteine and glutathione. Organisms treated with mercurials will act as if dead, but these can be revived by the addition of cysteine or thioglycollate. Regardless of this most interesting finding, the mercurials have proved excellent agents for use. In order to reduce the corrosive and protein precipitating properties of mercury salts, complex organic mercury compounds have been developed for use in disinfection. These include thimerosal nitromersal, phenyl mercuric nitrate, mercocresols, acetomeroctal, hydroxy-phemylmercuric chloride, and so on.

Except for compounds of silver, the other heavy metals have offered little to the field of disinfection. Zinc, copper and aluminum salts have good astringent qualities with minimal antibacterial properties. Silver nitrate has been widely used as a disinfectant for the eyes of newborn infants to prevent opthalmia neonatorium because of its effect against *Neisseria gonorrhoea.* Ammoniacal silver nitrate is still widely used as a disinfecting agent for the preparation of dental cavities prior to filling. Many preparations of silver such as Argyrol, Protargol and Silvol have been found useful for disinfection and treatment of infections. In most instances, these compounds have some irritating and astringent qualities as well as the strong tendency to stain or discolor tissues.

10. Oligodynamic metals. It has been observed that small amounts of metallic ions in solution have an antibacterial effect. This has been observed especially with silver, and to a much lesser extent with copper, gold, aluminum, tin and iron. The metallic ions are rapidly adsorbed and act as a protoplasmic poison and antienzyme. The enzymes can be restored by the removal of the metallic ions. The usefulness of this phenomenon has not been wide, but such products as 0-silver, Movidyn, Fissan-silver and others have been offered as therapeutic and disinfecting agents.

11. Sulfonamides. The discovery that the active principle of Prontosil was sulphanilamide opened a new field of chemotherapeutic research. Many forms of the so-called "sulfa-drugs" have been developed, some with less toxicity and more solubility. The action of these compounds is bacteriostatic rather than bactericidal in nature, with the main effect being on enzyme systems of susceptible organisms. One of the methods of action is its competition with the vitamin para-amino benzoic acid for metabolites in essential enzyme systems. Once they enter the metabolic pathway, they interfere with the normal course of events and stop the enzymic action. This results in bacteriostasis and the body defense is able to remove the quiescent pathogen with ease. This explanation is supported by the fact that an excess of para-amino benzoic acid interferes with the bacteriostatic action of sulfonamides and susceptible organisms can grow. The desirable bacteriostasis of sulfonamides is largely an in-vivo process that has a definite spectrum. Not all bacteria or even members of susceptible genera show the same degree of susceptibility to these drugs. The use of these compounds as disinfectants

Table • Numbers of cultures of dental importance found sensitive to various antibiotics

Organisms	Penicillin	Dihydrostreptomycin	Chloramphenicol	Chlortetracycline	Oxytetracycline	Bacitracin	Erythromycin	Polymyxin-B	Tetracycline	Neomycin	Nitrofurantoin	Novobiocin	Total no.
Streptococcus viridans	107	89	120	113	111	112	111	5	103	14	112	117	126
Streptococcus hemolyticus	376	225	486	331	312	431	421	40	296	135	476	471	501
Streptococcus anhemolyticus	71	47	101	78	70	84	87	33	66	32	86	98	105
Enterococci	77	28	105	49	45	92	89	7	44	26	95	93	107
Diplococcus pneumoniae	192	160	211	200	205	198	194	11	192	30	76	211	211
Staphylococcus aureus	779	708	1,050	673	649	1,062	1,038	295	661	1,050	1,121	1,157	1,180
Hemophilus	26	28	36	34	34	29	27	4	30	9	33	36	36
Candida albicans	0	0	0	0	0	0	0	0	0	0	0	0	30
Total sensitive	1,628	1,285	2,109	1,478	1,426	2,008	1,967	395	1,392	1,296	1,999	2,183	
												Total organisms	2,296

has little to offer in the field of dentistry.

12. Chemotherapeutic agents for *Mycobacteria*. Studies on the metabolism of members of the *Mycobacteria* have led to some new therapeutic approaches for tuberculosis and leprosy. It was found that the tubercle bacillus metabolized benzoic and salicylic acids. This led to the study of similar compounds that could be used to block this metabolic pathway As a result, para-aminosalicylic acid (PAS) was found to be an effective therapeutic agent which could be given to patients. An additional antituberculosis drug, isonicotinic acid hydrazide (INH or isoniazid) has been developed.

13. Antibiotics. Numerous antibiotics have been developed from various soil bacteria and fungi. The spectrum of some of these that are available to medicine and dentistry is shown in the table. Most of these have selective effect on the bacteria commonly found in the oral cavity, but none of them has either bactericidal or bacteriostatic effects on all. Their selective action on the various organisms is referred to as their antibiotic spectrum. Unlike the sulfonamides, the antibiotics show inhibition of bacteria in the laboratory as well as in the patient. Because of this, laboratory tests have been developed to aid in the selection of the specific antibiotic for treatment of pathogen involved in the infection. This test is called the antibiotic sensitivity test. The table shows that none of the 30 *Candida albicans* was affected by the antibiotics listed. Cases of thrush caused by *Candida* have been found to be treatable with nystatin, a relatively new antibiotic which has selective action against yeasts. It should be noted that of the 2,296 strains of the organisms

listed, the most effective antibiotics were novobiocin, chloramphenicol, bacitracin and erythromycin. The chemotherapeutic agent, nitrofurantoin, ranked with this group by the laboratory tests.

The mode of action of antibiotics on bacteria are either bactericidal as demonstrated by penicillin and streptomycin or by bacteriostasis as shown by chlortetracycline, oxytetracycline and chloramphenicol. In dilute solution the principal effect is inhibition. The basic action is their ability to interfere with metabolites and metabolic pathways. In addition, penicillin is known to interfere with cell division and organisms growing in media containing penicillin frequently assume bizarre shapes and show a reduction in their growth rates. On the other hand, streptomycin exerts its main effect on oxidative processes. The use of antibiotics for "cold" disinfection is a practice to be avoided as none of the antibiotics can prevent the growth of all of the possible human pathogens.

■ *Comment*

Such a discussion could be summarized by pointing out that chemical disinfectants are poor killing agents when compared with sterilization by heat. Therefore, whenever possible, autoclave or dry oven sterilization should be the routine of the office.

Presented as part of a panel discussion, "Oral Surgery Technics in Everyday Practice," ninety-ninth annual session, American Dental Association, Dallas, Texas, November 10, 1958.

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■ Yards and Pounds

Directors of standards laboratories in Canada, New Zealand, the United States, the United Kingdom, South Africa and Australia, recently agreed to adopt an international yard and an international pound having the following definitions: the international yard equals 0.9144 metre; the international pound equals 0.45359237 kilogramme. It was further agreed that all nonmetric calibrations carried out by the above laboratories for science and technology after July 1, 1959, will be made in terms of the international units so defined. The conversion factor for the international pound was selected so as to be exactly divisible by 7 to give the following value for the grain:

1 international grain = 0.06479891 gram.

The grain is the common unit in avoirdupois, apothecary and troy pounds. There are 7,000 grains in the avoirdupois pound, and 5,760 grains in both the apothecary pound and the troy pound.—*NSB Technical News Bulletin 43:2 Jan. 1959.*

Use and abuse of antibiotics in dentistry

■ *Edward J. Degnan,* D.D.S., Albany, N. Y.*

Antibiotic therapy has been grossly abused by the dental and medical professions in the past decade; some of the most questionable practices are to be found in oral surgery. Major faults include (1) the routine use of antibiotics for all dental surgery, (2) failure to take advantage of laboratory culture and sensitivity tests when planning antibiotic therapy, and (3) use of these drugs in too small a dosage and for too short a time to achieve a therapeutic result. Antibiotics are not a substitute for careful diagnosis or surgery or meticulous operative technic.

It is a well recognized fact that there has been a gross abuse of antibiotic therapy in the last decade. That the dental profession has also been culpable is a fact, certainly not a pleasant one, but a fact that must be recognized if a realistic appraisal is to be made of current trends in therapy. The great increase in numbers of resistant strains of organisms and the ever growing number of allergic reactions to antibiotics in the last ten years have led to the realization that there has been an indiscriminate use of these therapeutic agents that certainly borders on professional negligence. At the very least it shows that many in the dental profession do not take the time to read current medical and dental literature. Antibiotics never have been and never will be a substitute for sound diagnosis, surgery or meticulous operative procedures.

To point up the abuses, three examples can be cited. A patient referred to me because of a "nonspecific gingivitis" gave in her history that she had been receiving 1,000,000 units of penicillin a day for six weeks. Further questioning revealed that this patient was an epileptic suffering from hyperplasia caused by diphenylhydantoin sodium therapy. Not only was the dentist at fault in his hasty diagnosis, but I cringe to think of the number of penicillin resistant organisms developing from this haphazard therapeutic regime. Another patient had been on tetracycline therapy for a month for "chronic gingivitis." Examination of this mouth showed gross calculus deposits with no periodontal therapy as yet being initiated. A third patient with the classical symptoms of a localized osteitis secondary to dental surgery had been on oxytetracycline therapy for three weeks with no

treatment directed toward the local lesion. These examples are extreme; nevertheless, it should make dentists realize that there is a real need for more "antibiotic education" at the level of the local societies on the indications and contraindications for these agents. Antibiotics are used in dentistry principally in oral surgery, endodontics and periodontics.

■ *Oral Surgery*

It is in oral surgery that some of the most questionable practices relating to antibiotic medicine can be found. One of the faults is the routine use of antibiotics for all dental surgery. Of equal seriousness is the alarming number of members of the dental profession who do not take advantage of laboratory culture and sensitivity tests when planning a course of antibiotic therapy. Also of major significance is that when these drugs are used, they are used often in too small a dosage and for too short a time to achieve a therapeutic result.

The important question of when antibiotics are not needed will be discussed first.

1. Chronically abscessed tooth. An otherwise healthy individual with a chronically abscessed tooth with periapical involvement can be treated simply by extraction of the offending tooth. Whether incision and drainage are necessary is up to the surgeon, but certainly this surgical intervention will not necessitate a course of antibiotics. An uneventful recovery can be anticipated.

2. Acute pulpitis. The pain associated with acute pulpitis is most severe in many instances, but antibiotics are not going to reduce the pain. The only cure for this condition is possible removal of the caries with sedative dressing or extraction. The patient's primary need is for analgesics, not for antibiotics.

3. Cyst and impaction surgery. When there is no evidence of infection such as elevation of temperature and of the white blood cell count and regional lymphadenopathy in an otherwise healthy person, there is no reason for the routine use of antibiotics in cyst or impaction surgery. If a clean bone defect is left, the bone margins smoothed, bone spicules removed, a good soft tissue flap designed, and adequate supportive care given, there is no need for antibiotics. Certainly there may be varying amounts of pain and edema, but these can be controlled to a large extent by drugs specific in their action for these symptoms. Only in the presence of secondary infection is the dentist justified in starting antibiotic therapy.

4. Pericoronal infections. When the pericoronitis is either mild or chronic in nature, response is most rapid to local conservative care, without the use of antibiotics locally or systemically. Irrigation of the inflamed tissue, installation of one of the analine dyes and removal of any offending agent (such as a maxillary third molar that is traumatizing soft tissue in the lower third molar region) are adequate to bring about complete resolution of symptoms and allow extraction of the offending mandibular tooth if necessary at a later time.

5. Facial fractures. Whether it is necessary to use antibiotics when facial fractures are present is entirely dependent on the type of fracture. There are certain fractures where the patient will not need antibiotics. By and large, condylar and

subcondylar fractures and fractures of the ascending ramus are not compounded and will respond to conservative treatment without antibiotics if no open reduction is contemplated.

6. Localized osteitis. Probably more drugs have been used for dry sockets than can be imagined. I feel certain that there is no report in the dental literature to show that antibiotics applied either locally or systemically have ever hastened the healing process or diminished the pain associated with dry sockets. All dentists know that if the socket is cleared of debris and packed with antiseptic-analgesic dressing, the pain will diminish, probably aided by systemic analgesics. All dentists know that it will take from two to three weeks for epithelization to cover the exposed bone and no antibiotics or combination of antibiotics will speed up this process.

Just as the contraindications for antibiotics are clear, equally clear and well defined are indications for the use of these drugs. In operative surgery there are two distinct reasons for the use of antibiotics. The surgeon must be concerned with the eradication of established infection and also with prophylaxis, particularly in the postoperative period. Yet he must be ever watchful against a possibly overenthusiastic use of antibiotics. Such dangers as staphylococcal resistance and allergic or anaphylactoid reactions must be weighed against the benefits desired. Antibiotics must be used in sufficient quantities. There is no such thing as a "little antibiotic therapy." This type of therapy will not stop an infective process. It will only accomplish one thing—a rapid build-up of antibiotic resistant strains of organisms.

Definite indications for the use of antibiotic therapy in oral surgery are as follows:

1. An acute dentoalveolar abscess is a serious surgical problem, especially when accompanied by fever and a white blood cell count elevation. The possible serious complications resulting from this type of infection are well known. This clinical entity requires prompt treatment, especially from the point of view of antibiotic therapy, and, conditions permitting, prompt surgical intervention. Patients are started on one of the following courses of therapy, penicillin being preferred if the patient is not sensitive: (a) penicillin V potassium, 400,000 units orally three times a day; (b) erythromycin, 500 mg. immediately and 250 mg. four times a day; (c) tetracycline, 500 mg. immediately and 250 mg. four times a day. Therapy should be continued for at least three days after the temperature has returned to normal.

2. Acute pericoronitis. The same course of therapy is used for an acute pericoronitis associated with elevation in temperature and white blood cell count, regional lymphadenopathy and possible trismus. The possibility of the infection degenerating into a parapharyngeal abscess, submaxillary lymphadenitis or even Ludwig's angina is a real one and prompt and adequate antibiotic therapy is necessary.

3. Facial fractures. Certainly any compound fracture of the maxilla or mandible should receive prompt antibiotic care. When the word "compound" is used, it must be made clear that this includes any fracture that goes through an alveolus. Procaine penicillin, 600,000 units twice

a day, streptomycin 500 mg. twice a day, have been used with good results.

4. Osteomyelitis. A proved case of osteomyelitis of the facial bones demands prompt and relatively long-term treatment with antibiotics. Erythromycin 1 Gm. intravenously, dripped in over an eight hour period, supplemented with 2 Gm. a day orally, in divided dosage, has been used successfully when the condition is acute. After the acute symptoms are resolved, intravenous therapy is discontinued and oral medication is continued until sequestrums are removed and there is ample evidence that hard and soft tissue repair processes are under way.

5. Accidental perforation of maxillary sinus. It has been found that the use of prophylactic and broad spectrum antibiotics after antral perforation during oral surgical procedures will minimize the danger of maxillary sinusitis. Tetracycline, 500 mg. immediately and 250 mg. four times a day for five days, is used.

Although I object most strenuously to the term "routine antibiotic care," nevertheless, the regular use of antibiotics is fully justified when dental surgery is to be performed in patients who are afflicted with any of the following conditions: rheumatic heart disease, congenital heart disease, subacute bacterial endocarditis, rheumatoid arthritis, diabetes or renal disease, or for patients on steroid therapy or receiving radiation for malignant tumors of the head and neck. It must be remembered that these patients are all debilitated to some extent, at least physiologically if not physically, and should not be subjected to any secondary dental infection if at all possible. Usually broad spectrum antibiotics have been found to be most adequate. Tetracycline, 250 mg. four times a day, is administered for five days starting the day before the date of contemplated surgery.

■ *Endodontics*

It is generally conceded that success in endodontics is primarily dependent on rendering the root canal and periapical tissues sterile prior to filling the canal. The single most important factor in achieving this state is proper mechanical debridement of the canal. Antibiotics locally or systemically will not debride a canal.

Statistical evidence such as that presented by Buchbinder[1] and Appleton[2] makes it difficult to contest seriously the fact that the percentage of success is greatly increased by the addition of culture-taking to an otherwise sound technic. Cultures will reveal such a variety of organisms that no single antibiotic is effective against all of them. It is because of this that the polyantibiotic paste recommended by Grossman has been used with success. However, Smayda[3] feels that local antibiotics have no great advantage over standard nonantibiotic sterilizing agents. He feels that a meticulous instrumentation is the single most important factor. It is his conviction that it is a virtual impossibility to eliminate all the organisms from the canal and the dentist must effect, if possible, a quantitative reduction in the bacterial population of the canal. On occasion, when a culture is persistently positive with or without suppuration, he will use antibiotics but only on a systemic basis. As stated previously, there should be no hesitation about using antibiotics with patients who are afflicted with any

of the afore-mentioned diseases. Leavitt and co-workers[4] suggest that it would be well to use trypticase soy broth with 0.1 per cent agar which will culture not only the aerobes but the anaerobes as well, the latter organisms being present in a higher percentage than was previously thought.

■ *Periodontics*

Much of what has been said about the use of antibiotics in surgery and endodontics applies to periodontics as well. What is needed primarily in acute and chronic gingivitis, periodontitis or periodontosis is a careful examination of the patient, an adequate diagnosis and good periodontal therapy. Again, all the antibiotics at the dentist's command will not remove calculus, clean bony pockets, or correct a faulty occlusion.

The problem of an acute severe Vincent's infection can be a most serious one, however, and dentists are aware of the complications that can develop if it is untreated or treated inadequately. When a patient is febrile, when the temperature and white blood cell count are both elevated, possibly accompanied by regional lymphadenopathy, a course of antibiotic therapy should be initiated immediately. We prefer to use penicillin V potassium, 400,000 units three times a day. If the patient is allergic to penicillin, erythromycin, 500 mg. immediately and 500 mg. twice a day, can be administered. Of course it is important to start local care immediately in the form of irrigations, removal of gross calculus deposits and necrotic tissue.

■ *Conclusions*

1. Antibiotic therapy has been abused by both the dental and medical professions.

2. Antibiotics are not innocuous agents and their use is often attended by complications far in excess of the disease entity they were supposed to cure.

3. When these agents are used, they must be used long enough and in dosage strong enough to give a therapeutic result.

4. Antibiotics are not a substitute for careful diagnosis or surgery or meticulous operative technic.

5. If good antibiotic medicine is to be practiced, constant study of the current dental and medical literature on the part of the dentist or physician is essential, and changes of trends in therapy must be noted. Full use should be made of relevant data.

Presented as part of the panel discussion, "Use and Abuse of Antibiotics and Chemotherapeutic Agents" at the ninety-ninth annual session, American Dental Association, Dallas, Texas, November 10, 1958.

*Staff oral surgeon, Veterans Administration Hospital.

1. Buchbinder, M. A statistical comparison of cultured and non-cultured root canal cases. J. D. Res. 20:93 April 1941.

2. Appleton, J. L. T. Bacterial infection with special reference to dental practice, ed. 4. Philadelphia, Lea & Febiger, 1950, p. 496-501.

3. Smayda, C. R. Personal communication, March 1958.

4. Leavitt, J. M.; Naidorf, I. J., and Shugaevsky, P. Aerobes and anaerobes in endodontics. II. A sensitive culture medium for detection of both aerobes and anaerobes. New York J. Den. 25:377 Dec. 1955.

■ ANCESTRY

The man who has nothing to boast of but his illustrious ancestors is like a potato—the only good belonging to him is under ground.—*Sir Thomas Overbury.*

Sterilization of anesthetic cartridges in office practice

■ *Robert V. Walker, D.D.S., Dallas, Texas*

A strict sterilization technic to prevent contamination of local anesthetic solutions, needles and syringes is essential to the proper and successful practice of dentistry. Because of possible inadequacies or leakage of sterilizing liquids into the anesthetic solution, chemical sterilization is considered to be inadequate. A simple and completely effective system of sterilization by wrapping of the equipment and cartridges in paper envelopes and autoclaving them is strongly recommended as a routine procedure.

Dentistry has, through diligence and adherence to a rigid discipline in keeping abreast of accepted sterilization technics, advanced to a level comparable to that of medicine. With the development of the compact and efficient office autoclave, the dentist is now able to effect a degree of instrument and materials sterilization heretofore unobtainable in the office. There would appear to be little justification for any office not to be equipped with an autoclave with the present day production of such equipment in numbers that make them available for almost any type of practice and at a cost within easy consideration.

The possibility of transferring viruses responsible for infectious hepatitis and homologous serum jaundice through the use of needles and syringes improperly sterilized has received widespread and justified coverage in the medical and dental literature.[1-3] The fact that the dentist's livelihood depends on the production of good local and regional anesthesia through the technic of properly executed injections demands that he have a thorough understanding of the safeguards required for orderly and uneventful injection routines. Boiling water and flowing steam at a temperature of 212°F. are no longer recognized as being capable of efficiently destroying the most resistant bacterial spores or certain viruses[4] which indigenously inhabit and contaminate the dental operative field and subsequently his instruments. Perhaps the only truly safe method of sterilization is the production of high degrees of heat, and this is probably best produced through saturated steam under pressure.

Dentists have been quick to recog-

nize this fact, and consequently there are few offices at present that are not equipped with an autoclave capable of producing a controlled atmosphere of saturated steam under pressure. There are few dentists practicing who would jeopardize their patient's safety or health without the protection afforded through thorough cleansing and sterilization of their needles and syringes by acceptable sterilization standards.

■ *Sterilizing the Anesthetic Cartridge*

Even with the increased vigilance directed toward needle care and sterilization in the dental office, there remains a glaring deficiency in the sterile chain of anesthetic injection. This is in the management of the anesthetic cartridge. Probably the greatest advance in the standardization of solutions of local anesthetic and vasoconstrictor has been the development of the anesthetic cartridge which provides in a convenient vial the optimal proportions of anesthetic and vasoconstrictor compounded under sterile and controlled conditions. The dentist at one time had to mix and compound these solutions himself under conditions considerably less than ideal. The sterility of the solutions in the cartridge alone is of great importance, but the matter of ease and convenience in the use of this cartridge is no less a factor in the conduct of a busy office. Probably this matter of ease in its use has been the biggest culprit in the neglect of proper care for the anesthetic cartridge. It has been dumped into various washes alluded to as "sterilizing solutions," lifted from the packaging container and taken directly to the syringe, dropped to the floor and picked up for use, stored in cluttered dental cabinet drawers for immediate use, carried in the dentist's jacket pocket. The comments are facetious, but the point remains that little attention is given the care of the anesthetic cartridge.

There is no issue to be taken with the cartridge as it arrives at the dental office in its vacuum container. It is the sterilization of the outer surface of the cartridge and the maintenance of this sterility that is the consideration of importance.

Probably the most acceptable technic at the moment for the care of the anesthetic cartridge is to place it in a chemical disinfectant and rely on this solution for adequate protection of the vial prior to use as an injectant.[5] Regardless of the care given disinfecting solution baths, it is practically impossible to keep them completely free of contamination or bacterial growth. The continued "dipping in and out" with instrument forceps makes the solution unreliable, and the covering of these containing vats is not adequate to prevent atmospheric contamination. There are recorded instances, admittedly rare, where death has occurred as a result of lethal pathogens residing in disinfecting solutions which have been carried to the patient by injection on a needle supposedly sterilized in the solution.[6] The possibility of such a contamination occurring by storage of anesthetic cartridges in solution is no less real than it is for syringes and needles. Perforation of a contaminated rubber diaphragm with the deposition of the contaminant into the injectant solution is a real possibility.

A training program in anesthesiology

at a local hospital for a few years utilized chemical disinfectant solutions to contain rubber band bound vials of the necessary anesthetic solutions, anesthetic powders and diluents that are normally used to produce regional or spinal anesthesia. These bound vials of anesthetic and diluents, similar to the dental anesthetic cartridge, would be "dipped out" with sterile instrument forceps as required and placed on injection trays. Subsequent bacteriological incubation of material obtained from these vials where they had been in constant point contact and where the rubber band had bound them tightly together grew substantial growths of various organisms. This occurred in spite of the fact that these sterilization solutions (and several were used) were as closely attended and supervised as would be possible under almost any type of clinical situation. Needless to say this procedure was abandoned and a safer routine established.[7] The newer routine, autoclaving of the anesthetic and diluent vials, has served as the stimulus for the introduction of a similar routine in the clinics of the Parkland Memorial Hospital.

The method employed for the sterilization and storage of anesthetic cartridges is remarkably simple yet highly effective. Glassine envelopes or bags 2 by 5 inches in size are utilized to contain our anesthetic cartridges. These bags preferably should be made from a white sulfite bond paper of high bursting strength, with controlled porosity to permit adequate steam permeability during sterilization and limited air permeability after sterilization. In addition, all seams and folds of the bag should be uniformly sealed with heat-resistant adhesive to prevent opening during sterilization.[8] These qualifications are met in the disposable sanitary paper wraps for syringes, needles, and instruments obtainable at a moderate price from all instrument supply houses. A sufficient number of these envelopes containing sterile cartridges can be made up once a week by anticipating the work load for the week and preparing the necessary number. Normally we prepare an equal number of envelopes containing one and two cartridges. As the glassine envelopes are heat-sealing in property—that is, at the proper temperature any edges or sides of the envelope will adhere to one another—we have inserted 3 by 3½ inch cards (cut from standard 3 by 5 filing cards), rolled so that only two edges approximate and form a sort of cylinder, into the envelopes to hold the sides apart and prevent their adhering to the cartridges or to each other. The rolled card cylinder also serves as a receptacle for the cartridges and facilitates their removal from the envelope without contamination. The nurse, assistant, or doctor, in preparing the injection set-up, may grasp the bag and tear cleanly across the envelope against the rolled up card much the same as if the paper were perforated. The cartridge may then be dumped easily on the injection tray or on a sterile towel without fear of contaminating the ends or sides by the adjacent edges of the envelope held apart by the rolled or cylinder shaped card insert.

A third item to be placed in the envelope is a paper sterilization indicator. A paper indicator which has color increments on its face that will undergo color changes when exposed to moist heat at 250°F. for 5, 12½, and 20 minutes is preferable. These paper indicators are

nominally priced and pose no economic burden.

In preparing the envelopes for sterilization by autoclave it is necessary to check each bag for three essential contents: (1) the 3 by 3½ inch rolled cardboard insert; (2) the number of anesthetic cartridges required in each envelope, and (3) a paper sterilization indicator for the dentist's personal check of whether the bag has been processed correctly and adequately. When all are present the flap of the envelope is ready to be sealed by either a small hot iron or an inexpensive device especially designed for such a task. After sealing, the bags are autoclaved at 250° to 254°F. for 20 minutes. The autoclave is exhausted slowly over a 20 to 30 minute period to prevent the expulsion of the rubber diaphragm at the plunger end of the cartridge by a sudden change in temperature and pressure.

The question arises as to what such heating does to the solutions contained in the usual anesthetic cartridge. From controlled studies performed by Whittet[9] it is evident that most of the local analgesics utilized in dentistry are stable after at least one autoclaving and some do not lose potency even after repeated autoclaving. This is particularly true with lidocaine which retained 100 per cent of its potency even after six autoclavings. Our experience with autoclaved cartridges has borne out these observations, and there have been no failures of local or regional anesthesia which we have felt were attributable to loss of potency of the anesthetic solution.

Another question which might be raised is why all the fuss over the anesthetic cartridge in the first place. It is necessary only to review the Woolley and Roe case[10] in England to appreciate the significance and gravity of injecting solutions from vials which have become contaminated by immersion in a disinfecting solution. Although in this instance the defendant physician was exonerated because he had adhered to the accepted sterilization methods of the time (1947), there is little to exempt a physician or dentist from liability should minor or major disaster occur and he has refrained from practicing a safer established routine. Apart from the medico-legal aspect, dentists, as representatives of the healing arts, should be morally motivated to provide only the safest methods for their patients.

■ *Summary and Conclusions*

Unfortunately, one of the most convenient items in the dentist's injection armamentarium, the anesthetic cartridge, is probably the least attended insofar as sterilization is concerned. A convenient and completely effective technic for the sterilization of these cartridges by wrapping in paper envelopes and autoclaving is recommended as an aid to the dental sterile injection routine.

The development and production of a compact and efficient autoclave has revolutionized office sterilization by the dentist, making it possible for him to effect complete sterilization of all needed items and instruments.

Chemical disinfecting solutions are not recommended for the storage of anesthetic cartridges because of the possibility of percolation of these solutions through minute flaws in the cartridge wall or the rubber diaphragm with resultant contamination of the injectant solution.

Wrapping anesthetic cartridges in proper paper envelopes and autoclaving this package is a completely effective method of cartridge sterilization and office storage.

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*From the department of surgery, University of Texas Southwestern Medical School.

1. Trumbull, Merlin, and Greiner, D. J. Homologous serum jaundice. J.A.M.A. 145:965 March 31, 1951.

2. Runyan, John; Wright, A. W., and Beebe, R. T. Homologous serum jaundice; report of 8 fatal cases. J.A.M.A. 144:1065 Nov. 25, 1950.

3. Evans, R. J., and Spooner, E. T. C. Infections from syringes. D. Digest 57:274 June 1951.

4. Archer, W. Harry. Manual of oral surgery, ed. 2. Philadelphia, W. B. Saunders Co., 1956, p. 827.

5. Holland, M. R. Review of sterilization and disinfection in dentistry. Oral Surg., Oral Med. & Oral Path. 8:788 Aug. 1955.

6. Nevin, Mendel. Problems in dental local anesthesia. Brooklyn, Dental Items of Interest Publishing Co., Inc. 1952, p. 87.

7. Jenkins, M. T. Personal communication.

8. Perkins, John J. Principles and methods of sterilization, ed. 1. Springfield, Charles C Thomas, 1956, p. 187-189.

9. Whittet, T. D. Effect of autoclaving on ampoules of local analgesics. Anaesthesia 9:271 Oct. 1954.

10. Cope, R. W. Woolley and Roe case. Anaesthesia 9:249 Oct. 1954.

Armamentarium for surgery in office practice

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An oral surgeon is obligated to provide in his office whatever facilities are necessary to insure the same degree of safety and comfort that his patient would receive if the patient were treated in a hospital. The oral surgeon should decide what he expects to include in his office practice and then prepare himself properly to accomplish it. The dentist would do well to evaluate his over-all situation and exclude from his practice those procedures which potentially might exceed the limit of his preparations. Wise preparation of an office for the practice of oral surgery contributes toward bettering the total outcome of many operations.

The office facilities that should be provided for the practice of oral surgery need to be adequate for the patient's safety and comfort and for the best operating conditions for the surgeon. Such facilities include both major equipment and minor instruments. As such they represent the surgeon's armamentarium. To be adequate does not imply at all that such facilities need be elaborate or expensive.

■ *General Equipment*

The type of facilities required should be determined by the type of practice expected. A large volume, rapid turnover, emergency type practice, where provision for general anesthesia must be maintained at all times, requires quite a different physical set-up than does the smaller volume, planned surgery type practice.

Considerably different facilities are needed when patients require an extended general anesthetic for an operation performed in the office than when such procedures are to be carried out in a hospital. It may be said that the surgeon is obligated to provide in his office whatever facilities are necessary to insure the same degree of safety and comfort that his patient would receive if he were handled in a hospital. If such facilities are provided, there is no reason why office oral surgery should not compare favorably with hospital procedures. If, however, the surgeon is not able or willing to provide that degree of safety and comfort, he has little choice but to utilize hospital facilities for such work.

■ *Recovery Room*

All except the simplest of oral operations justify the use of agents and drugs which require recovery room facilities. A recovery bed at operating table height with provision for aspirator, light, and so on, makes the recovery room extremely useful for preliminary sedation and the induction of local anesthesia as well as for postsurgical recovery. When properly used, a recovery room reduces the time the patient occupies the operating room to that of the actual surgery. Thus a single operating room with adequate recovery room facilities can economically supply the same operating capacity as can a more expensively equipped operating suite of several rooms. Use of the recovery room has another advantage in its psychological effect on the patient. Lying down promotes the sedative effect desired from medication and reduces to the minimum reactions to local anesthetics.

■ *Operating Room*

The operating room itself should be arranged and equipped to expedite the surgery in every way possible. A satisfactory chair or table, adequate light, and dependable aspiration equipment are basic requirements. A cuspidor is not necessary. Actually it is detrimental to a surgical procedure. It distracts the patient, causes him to be changing his position constantly, and gives him an excuse to escape for a moment from the task at hand. A well designed operating room should depend on aspiration equipment exclusively. Roentgenographic equipment should be at hand to fill the need for surgical and postsurgical visualization of a situation as the need may present itself. Anesthetic equipment should be provided to meet every need of the anesthetist and should include all items required to meet any emergency.

■ *Asepsis*

The operating room should have access to sterilization equipment adequate to meet varying needs. Modern surgery is founded on asepsis. It is necessary, therefore, that all instruments and supplies be made sterile and be kept sterile until used. Usually an instrument cabinet of some type equipped with doors which can be locked and with shelves on which autoclaved covers are placed serves the purpose well. If the instruments and supplies are handled from the sterilizer to the storage cabinet to the operating tray with sterile instrument forceps, the requirements of asepsis in this regard are met.

A single sterilizer cannot accomplish

all that is required. Although rubber gloves, towels, dressings, and rust-proof instruments are satisfactorily sterilized in a rapid steam autoclave, there are some instruments which are better sterilized in an alcohol vapor autoclave. Handpieces, automatic chisels, drills, knives, and other instruments which are deteriorated by water are examples. The alcohol vapor autoclave provides ideal sterilization for needles and syringes. It cannot be used with rubber goods, however, and cotton materials are stained by it. Some items require cold sterilization as for example local anesthetic tubes and some suture tubes.

There are three items necessary to the aseptic technic in mouth surgery—rubber gloves, mouth prop and aspirator. Rubber gloves provide the only practical means of sterilization of the hands. The mouth prop and aspirator combination furnish a means of keeping the head position of the patient constant, the tongue and throat still. If the head moves to expectorate, or if the tongue and throat move to swallow, saliva floods the operative field and produces contamination. The intelligent use of mouth prop and aspirator lend to the average oral operation under local anesthesia the protection from salivary contamination which the same operations under general anesthesia have enjoyed for years, and for the same reason. The aspirator and mouth prop eliminate from the conscious patient the movement which general anesthesia automatically prevents, and gives to the locally anesthetized patient the same margin of safety from infection which has been clinically evident for many years when general anesthesia has been used.

■ *Emergency Measures*

Every operating room should have readily available to it the means of resuscitation of patients. If an anesthesia machine capable of administering oxygen is not available, then one of the small resuscitation units should be at hand at all times. Instruments needed to do an emergency tracheotomy should always be at hand, as well as the drugs most commonly needed in other emergencies. Especially, the surgeon should have at hand the means of combating anaphylactic shock and other allergic reactions. It is also essential that a procedure be established to accomplish without delay the surgical opening of a chest for cardiac massage. Such planning should insure the availability of the required instruments as well as training of the office personnel to expedite such measures if the emergency should ever occur. Provision for lesser emergencies should be made. Emesis basins, cups, towels, cellulose wipes, and so on, should be strategically located for use when needed.

■ *Operating Armamentarium*

Minor equipment and instruments depend on the surgeon and the types of surgery done. All items should be in proper condition for instant use. A well planned operation matched by the intelligent use of well selected instruments make for good surgery. Once the patient's safety and comfort are provided for, every effort in the selection of instruments should be toward executing the best surgery possible with the least total injury to the patient. No instrument should be overlooked if it will contribute to this end.

Generally speaking, surgical instru-

ments fall into three general categories as indicated by the use they are put to: (1) opening instruments; (2) instruments for the surgery proper; (3) closing instruments.

■ *Opening Instruments*

Most operations begin by gaining proper access to the surgical site so as to facilitate excision of the tissue and to safeguard that which remains. For oral surgery, various types of knives, periosteal elevators, retractors, and bone cutting instruments are used. The sharp interchangeable bladed knife is indispensable. A very useful auxiliary is the heavy bladed Austin type knife which serves admirably as a dissecting periosteal elevator. Separation of the mucoperiosteal flap is further accomplished by periosteal elevators of different sizes. Retraction of the flap may be done with specially designed retractors. However, periosteal elevators and straight curets serve the purpose well. Instruments for excising obstructing bone include the hand bone gouges, chisels, automatic chisels, and drill points of various types. The carbide tungsten drill point has done much to facilitate tooth division as well as bone removal. Many times rongeur forceps are excellent for the removal of obstructing bone tissue.

■ *Instruments for Surgery Proper*

Instruments required for the surgery proper naturally depend on the type of operation. Since the majority of oral procedures involve the removal of teeth, a variety of extracting forceps, elevators and root picks, is essential. The number need not be large if versatile instruments are selected and well handled. Ordinarily four to six forceps should be adequate. Universal type instruments should be selected as much as possible so as to avoid the confusion and duplication of "rights" and "lefts." Certain double-ended instruments have genuine merit. The need for powerful instruments such as cross-bar elevators seldom, if ever, exists. Generally speaking, small instruments are more versatile than large ones. Drill points and chisels for tooth division are frequently needed. Soft tissue excisions require curets, dissecting scissors, knives, tissue forceps, and hemostats. Exploration and aspiration of cavities prior to incision call for a Luer-type syringe and large gauge needle.

Traumatic surgery may require rather specialized instruments, materials, and devices. The simple intermaxillary fixation utilizes various pliers, wire cutters, and forceps as well as different types and sizes of ligature wire, elastics, arch wire, and special appliances. Open reduction approached either intraorally or extraorally requires a few special instruments. A set of Dingman bone holding forceps is very useful for both transosseous wiring and bone plating. Drill points are needed to bore holes in the bone. A screw driver is used in bone plating. Various types of suture passing instruments including pedicle needles facilitate transosseous wiring. Heavy cotton suture material for piloting the wire ligature through the holes is almost indispensable. A small cannula and trocar are useful in circumferential wiring, and long, large hypodermic needles are most useful for passing wires transfacially to head cap devices and for intrafacial suspensions. A special Ivy malar elevator is valuable when doing the Gillies operation for depressed zygo-

mas. Various types of tissue retractors, hooks, screws, and instruments such as towel clips serve useful purposes in many of the maxillofacial procedures. It is important to mention that dissimilar metals are not well tolerated when buried in tissue. Great care should be taken that bone plates and screws are of identical composition.

■ *Closing Instruments*

When the surgery proper is completed, the operative site requires attention directed toward shaping the remaining tissues, elimination of undesirable tissue and debris, the provision for hemostasis, and closure of the surgical wound. The shaping of the osseous tissue requires a variety of bone cutting instruments. Rongeur forceps of various shapes, chisels, automatic chisels, drill points, diamond faced points, and files are needed depending on the situation at hand. Soft tissue shaping is accomplished with knives and scissors. Curets, hemostats, and tissue forceps are helpful in removing undesirable tissue and debris. The aspirator is indispensable. Closure of the wound usually requires suturing. A needle forceps and scissors are needed together with various types of suture materials and needles as well as both absorbable and nonabsorbable suture materials. Sizes from no. 00000 to no. 00 should be available.

A word should be said about tungsten carbide points braised on to chisels and bone files. The extreme hardness of such cutting points makes the need for sharpening infrequent; however, it is well to have a diamond-faced disk available to sharpen such points when necessary.

Another extremely useful item is the diamond-faced inset which can be braised to needle forceps. An instrument so prepared facilitates the holding of suture needles at almost any angle without slipping, and helps to pick up fine suture material when instrument tying is done. Such an instrument will last indefinitely because it sustains no wear.

It is important to give surgical instruments proper care. Clean, lubricated joints facilitate use. Many instruments, including not only the cutting instruments but also such items as extracting forceps, elevators, and root picks, should be sharpened periodically so that the working edges retain their grasping action on the tooth surface.

■ *General Observations*

The problem of supplying the proper armamentarium for the office practice of oral surgery, therefore, centers largely around the type of surgery contemplated. The dentist should decide what he expects to include in his practice and then prepare himself properly to accomplish it. Since a patient has every right to expect his operation to be completed with dispatch, it is unfair not to have at hand every item of equipment which the operation or any surgical complication thereof might require. A surgeon who has not so equipped himself should not undertake the operation. The same thing may be said about emergencies which can arise in the office. Oral surgery entails certain hazards which can and do present situations requiring immediate and adequate action. An operator who has not in advance prepared himself properly with all items needed to meet all such situations should not invite patients to assume such

risks in his office. To be worthy of confidence demands that genuine effort be spent toward preparing oneself to execute surgery in a manner to achieve the greatest benefit with the least damage and risk. If such preparations have not been made, the dentist would do well to evaluate once again his own over-all situation and exclude from his practice those procedures which potentially may exceed the limit of his preparations.

The best time to make such exclusion is prior to the time of surgery. After trouble has arisen and help is needed is too late. Trouble should be anticipated before it occurs. It must be remembered that a surgical failure which has been salvaged to some extent by a fellow practitioner who has answered the distress call is no less a failure as far as that patient's opinion of the original surgeon is concerned. Nor does the salvaging operation remove the obligation of responsibility which rests on the shoulders of the original surgeon. Should an unfortunate total result occur, it may reasonably be assumed that a less unfortunate result might have been expected had not the situation been aggravated by the failure of the original surgeon. The time to shift responsibility should be prior to the time of surgery. If a surgeon is not prepared to accept full responsibility for the final outcome of an operation, he is unwise to make the start. It may be said, therefore, that wise preparation of an office for the practice of oral surgery may do much toward bettering the total outcome of many operations.—*1319 Medical Arts Building.*

Presented as part of a panel discussion, "Oral Surgery Technics in Everyday Practice," ninety-ninth annual session, American Dental Association, Dallas, Texas, November 10, 1958.

■ Five Food Fallacies

The notion that certain foods have special powers far out of proportion to their nutritional contents was contradicted by the results of a study made at the graduate school of public health of the University of Pittsburgh. These foods include yoghurt, blackstrap molasses, wheat-germ oil, brown sugar, "royal" honey and seaweed. Another fallacy holds that fresh fruits and vegetables are nutritionally poor or even dangerous because of the chemical fertilizers used in their cultivation. A third fallacy is to advocate fortifying the American diet with vitamins, trace minerals and other materials on the grounds that such enrichment will improve health beyond that of the usual adequate diet. A fourth fallacy is the belief that certain foodstuffs or systems of dieting have specific values in "curing" high blood pressure, cancer, anemia, heart disease and caries. A fifth fallacy is the regimen frequently advertised as specifically useful for treatment of obesity, including such restricted menus as bananas and milk, steak and prunes, raw tomatoes and hard-boiled eggs. Most of these diets are nutritionally inadequate as well as calorically inappropriate, and comparatively expensive.—*Robert B. Olson. Science Digest 45:48 May 1959.*

VOLUME 17 • NOVEMBER 1959 • NUMBER 6

CASE REPORTS

Treatment of oroantral fistula: *report of case*

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Various methods have been described for repair of oroantral fistula. However, the management of the occasional case in which there is extensive loss of bone of the antrum walls and floor from trauma or infection has not been reported adequately in the literature.

It is not uncommon to examine patients with long-standing oroantral fistulas and secondary chronic sinusitis that have had five or more surgical attempts at closure, all resulting in failure. In a given case, little criticism is justified because of a failure. Under the most ideal circumstances, failures occur.

In some instances the judgment exercised and repeated surgical attempts to close large antral defects leave much to be desired. On occasion, even when closure has been successful, the soft tissues have been so distorted as to eliminate the mucobuccal fold, and this, with the production of excessive scar tissue, creates a most difficult prosthetic problem.

In instances of large bony defects, the method of choice is believed to be as described in the following case report. The decision cannot always be made preoperatively, and consideration should be given to this procedure in every instance in which the amount of bone loss is not known prior to elevation of the buccal mucoperiosteum. Therefore, it is well to elevate the buccal mucoperiosteum as the initial procedure.

No rule of thumb is advocated as a basis of decision. In any large bony defect, this procedure may be considered, and particularly those involving loss of the tuberosity.

REPORT OF CASE—A white airman, 44 years of age, was transferred to the oral surgery service of the U. S. Air Force Hospital, Lackland, Lackland Air Force Base, on June 10, 1957, for evaluation and treatment of an oroantral fistula in the posterior region of the right maxillary tuberosity.

COMPLAINT AND HISTORY OF PRESENT ILLNESS—The patient complained of acute pain of the right maxilla and of an intermittent drainage from his right maxillary tuberosity with an accompanying foul taste. Past history revealed that the patient had experienced intermittent episodes of acute pain in the region of the right antrum after removal of the maxillary right second molar in January 1951. Two previous attempts to close the oroantral fistula had been unsuccessful.

EXAMINATION—The patient was a well-developed, well-nourished, 44 year old man. Intraoral examination showed a draining oroantral fistula in the right maxillary tuberosity. In the maxilla only the right and left first and second bicuspids were present. The missing teeth were replaced by a satisfactory and functional partial denture. The remainder of the intraoral examination was within normal limits and noncontributory to the chief complaint. His general physical examination was also within normal limits.

Roentgenograms of the patient's maxillary sinuses taken on June 10 showed a complete clouding of the right antrum. His chest roent-

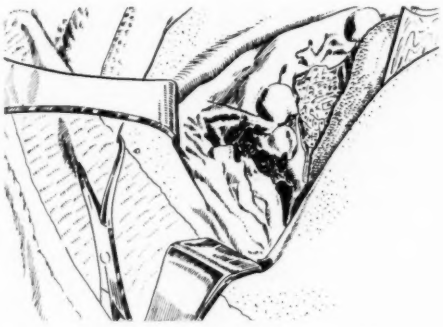

Fig. 1—Incision and reflection of mucoperiosteum

genogram showed a negative condition.

All laboratory examinations were within normal limits with the exception of a white blood cell count of 11,450.

TREATMENT AND COURSE — The patient was placed on routine hospital care and supportive treatment during his physical evaluation and workup. The patient's right antrum was irrigated daily through the fistula with copious quantities of warm normal saline solution. Considerable quantities of thick greenish-yellow, purulent exudate were evacuated from the right antrum during these daily irrigations. A daily program of oral hygiene was initiated on his admission to the hospital. This program consisted of an initial scaling and polishing of his teeth followed by a complete and vigorous toothbrushing five times a day.

OPERATION—Anesthesia was induced with ether, oxygen and nitrous oxide, and a naso-endotracheal tube was passed through the left nostril to ensure a patent airway during the continual administration of the anesthetic.

The skin of the face and neck were surgically prepared with Phisohex and draped to expose the oral cavity. An 8 cm. incision was made along the crest of the alveolar ridge of the right maxilla extending from the distal aspect of the pterygopalatal tuberosity to the distal surface of the right cuspid and running obliquely at this point into the labial sulcus (Fig. 1). This mucoperiosteal flap was elevated superiorly to expose the lateral wall of the right antrum. There was considerable loss of bone of the alveolar crest and lateral antral wall of the maxillary sinus in the region of the fistula. The lateral wall of the right maxilla and alveolar ridge had eroded, producing a perforation into the maxillary sinus 2 cm. in diameter. The sinus was completely filled with chronically infected polypi which were removed and the antrum thoroughly scrubbed with a firm gauze tampon and then irrigated with a fresh 7 per cent solution of hydrogen peroxide to control bleeding. The sharp bony margin of the antral defect was trimmed with a rongeur forceps and smoothed with a bone file.

Three holes were placed in the lateral wall of the antrum adjacent to the edge of the defect by use of a no. 6 round bur in a motor-driven handpiece. Mattress sutures of no. 00 silk were placed from the periphery of the mucoperiosteum through these holes in the bone and back again through the mucoperiosteal tissue so as to turn a cuff of the mucoperiosteum over the edge of the bone margin into the antrum and thereby create a permanent opening into the right antrum (Fig. 2). Eighteen inches of ¼ inch iodoform petrolatum gauze were packed into the right antrum and one no. 000 silk retaining suture was used to maintain the packing in place. Interrupted no. 000 silk sutures were used to return the remainder of the mucoperiosteal flap to position (Fig. 3). Estimated blood loss in this procedure was 150 cc. The patient withstood the proce-

Fig. 2—Cuff of mucoperiosteum turned over bony margin of antral wall

Fig. 3—Antrum packed with gauze

dure well and was returned to the recovery ward in good condition.

POSTOPERATIVE TREATMENT — The patient's postoperative recovery and convalescence were uneventful and without complication. The patient experienced minimal postoperative edema of the right face and very little pain. Antibiotic therapy consisting of 600,000 units of procaine penicillin and 0.25 Gm. of streptomycin sulfate administered intramuscularly was started on June 19. The antral pack was removed on June 24; the antrum was clean, and healing was progressing satisfactorily (Fig. 4). Antibiotic therapy was discontinued. The patient was placed on a daily program of antral irrigations, and on June 26 the sutures were removed.

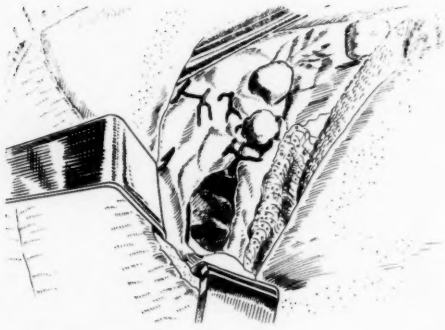

Fig. 4—Antrum after removal of pack on fifth postoperative day

The patient continued to progress satisfactorily, and on July 2 he was referred to the prosthetic service for the addition of an obturator to his maxillary partial denture (Fig. 5).

On July 18 the maxillary denture was inserted producing a satisfactory closure of the antral opening. On July 22 the patient was discharged from treatment.

RESULT—At the time of discharge, the patient was free of pain and the right sinus had begun to become well lined with oral epithelium. His maxillary partial denture with the addition of the obturator completely sealed

Fig. 5—Healed antral opening

the surgically produced permanent antral opening. The patient was physically fit for overseas duty.

CONCLUSIONS AND COMMENTS—A method has been described for the treatment of large oroantral fistulas. By turning the mucoperiosteum over the bony margin of the antral wall as described, a good soft tissue base is produced for the obturator in a minimum period of healing. Patients should be advised prior to operation that such a procedure may be elected at the time of surgery.

It is most inadvisable to attempt repeated surgical closures of oroantral fistulas in instances of obvious potential failure.

The opinions or assertions contained herein are those of the author and are not to be construed as official or as reflecting the view of the Department of the Air Force or the Air Service at large.

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Bilateral inverted supernumerary central incisors penetrating nasal cavity: *report of case*

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A few instances of supernumerary central incisors (mesiodens) erupting into the nasal cavity have been reported,[1-4] but this occurrence is rare. The following case presented a diagnostic as well as surgical problem.

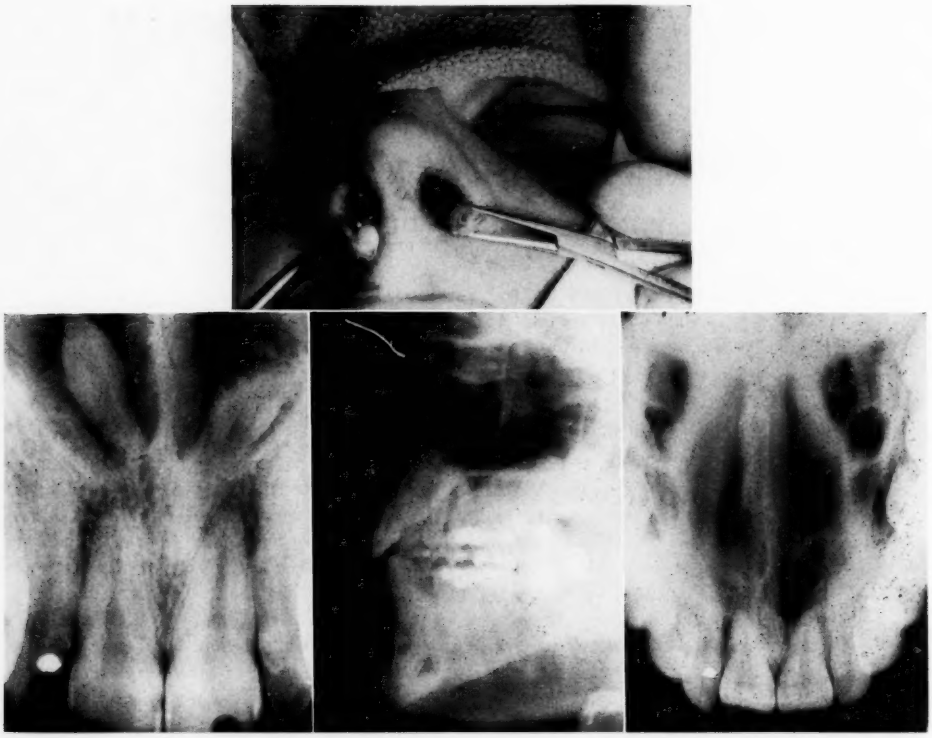
REPORT OF CASE—A white man, 20 years of age, was referred to the department of oral surgery, Ochsner Clinic, January 9, 1958, for removal of unerupted mesiodens that had been discovered on routine dental roentgenographic examination. The patient had no dental symptoms referable to this region but complained of nasal blockage necessitating use of drops to shrink the mucosa.

EXAMINATION — Periapical dental roentgenograms demonstrated that the mesiodens were inverted and directed superiorly with the crowns apparently encroaching on the nasal floor (illustration, left). An occlusal view revealed that the mesiodens were located apparently on the lingual side of the central incisors. However, this is more apparent than real in some instances because at this superior level above the apexes of the central incisor roots, the crown of an impacted tooth may appear to be on the lingual side of the roots but in actuality it is on the labial side. An 8 by 10 lateral view of the maxilla is always indicated to establish definitely the position of impacted teeth in that location so that a correct surgical approach can be employed. A lateral view of the maxilla (illustration, center) demonstrated that the mesiodens were on the lingual side of the incisor roots and the crowns seemed to penetrate the floor of the nasal cavity. The roots were in the palatal bone, the right one being the larger of the two and deeper in the bone.

Clinical examination revealed no abnormality of significance in the oral cavity. Because of the roentgenographic demonstration of apparent penetration of the nasal cavity by the crowns of the mesiodens and the complaint of nasal blockage, it was decided to examine the nares. With use of a nasal speculum a small part of the incisal portion of the crowns was seen about 1.5 cm. from the nasal orifices surrounded by acutely inflamed, edematous nasal mucosa. This was obviously the cause of the chronic nasal blockage.

It was decided to approach the mesiodens surgically from both an intraoral palatal and intranasal route. Obviously, the teeth would have to be delivered through the nares because of the position of the crowns.

OPERATION—On Jan. 20, 1958, after oral endotracheal induction of general anesthesia, an incision was made on the lingual side of the teeth in the gingival crevices from the left second bicuspid to the right second bicuspid. After the palatal bone was exposed by reflection of the mucoperiosteum with surgical burs, mallet



Left: Periapical view demonstrating apparent penetration into nasal cavity by mesiodens. Center: Lateral view of maxilla definitely demonstrating palatal position of mesiodens and penetration into nasal cavity. Above: Mesiodens after removal through the nose. Right: Postoperative view of maxilla

and chisels, windows were cut into the bone over the roots of both mesiodens. Additional bone was removed from around the roots until there was sufficient mobility to deliver the teeth. The teeth were then displaced by a mallet and a straight elevator into the nose while under direct observation with a nasal speculum and they were then removed with the aid of curets (illustration, above). Profuse nasal bleeding from the acutely inflamed mucosa necessitated nasal gauze packs. Absorbable gelatin sponge was placed in the palatal bony defects, the palatal mucoperiosteal flap was returned to place, and the wound was closed with interproximal no. 0000 black silk interrupted sutures.

POSTOPERATIVE COURSE — Postoperative roentgenograms (illustration, right) revealed the bony defects. The postoperative course was uneventful. The degree of nasal blockage decreased immediately after removal of the packs. When seen two weeks postoperatively, the patient had no nasal obstruction.

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†Formerly, member of department of otolaryngology, Ochsner Clinic.

1. Charleroi, B. A case of supernumerary tooth in nose. D. Cosmos 53:1457 Dec. 1911.

2. Long, C. J. Supernumerary tooth in nose. D. Cosmos 66:360 March 1924.

3. Stafne, E. C. Supernumerary upper central incisors. D. Cosmos 73:976 Oct. 1931.

4. Fastlicht, S. Supernumerary teeth and malocclusion. Am. J. Orthodont. & Oral Surg. 29:623 Nov. 1943.

VOLUME 17 • NOVEMBER 1959 • NUMBER 6

The dental internship

ALTHOUGH THERE ARE MANY PROBLEMS related to the development of a program of dental internships as a standard prerequisite to dental practice, its final accomplishment would be a tremendous step forward in dental education that would yield great dividends to both the profession and the public. An increase in the quality of dental practice, improvement in professional and public relations, further elevation of the level of productivity of the average practicing dentist and, in general, a substantial increase in the professional position of the average dental practitioner would then occur naturally.

Obviously, it is impossible to institute such a total program at present since there are insufficient training centers available and a grossly inadequate number of well-trained men who are interested in teaching graduate students at the intern level. However, the number of rotating dental internships is increasing steadily, and there is now at least a glimmer of hope that the objective of internships as a standard prerequisite will be accomplished within a reasonable length of time.

The rotating dental intern who is adequately exposed to hospital procedure as a part of his graduate experience becomes more competent in comprehending the associated medical problems of his patients, as well as becoming more competent in the technical aspects of his practice.

As hospital dental departments increase in number, it is hoped that considerable emphasis will be placed on graduate education so that increasing facilities will be made available for the training of dental interns. Hospitals everywhere are looking forward, and in many instances planning, to include dental sections in their organizations. Proper dental leadership at the local level usually will stimulate the hospital administration to provide facilities that are in keeping with dentistry's professional position and its ability to contribute to total health care. The Council on Dental Education of the American Dental Association is constantly evaluating and re-evaluating educational

standards and, as a result, it is most effective in assisting the development of such programs. It is our sincere hope that there will be more and more well qualified dentists who will be sufficiently interested and far-sighted to aid in the development of training programs in hospitals. Their continuing efforts at the local level, coordinated with the programs of the Council on Dental Education and the Council on Hospital Dental Service, will provide the stimulus that is necessary to achieve dentistry's next big educational objective—internships for all dental graduates of the future.—*Fred A. Henny.*

The importance of cooperation between medicine and dentistry in the field of anesthesiology

THE RECENT CHANGE of title of the *Journal of Oral Surgery* to the JOURNAL OF ORAL SURGERY, ANESTHESIA AND HOSPITAL DENTAL SERVICE was a timely recognition of the subject of anesthesiology in dentistry and reminds us of an important phase of the development of dental anesthesiology—the relationship between medicine and dentistry in the field.

Anesthesia has developed differently in dentistry from medicine. Although the emphasis in dental practice has been on regional anesthesia, general anesthesia continues to be an important and necessary service for certain patients. These patients are almost always ambulatory and can be treated effectively in the office.

Physicians trained in anesthesiology receive their postgraduate training in hospital operating rooms, and often have little understanding of the office practice of anesthesiology. Because of their backgrounds, it is natural that they should lean toward hospitalizing all patients requiring general anesthesia. These physicians must be educated to understand the philosophy of general anesthesia for ambulatory patients and why it is a necessary service.

More training facilities for dentists in anesthesiology are needed in hospitals, where there is an active outpatient dental department as well as an operating room anesthesia training program. Dentistry needs the assistance and cooperation of medicine in this regard.

Dentists who receive anesthesia training in hospitals must, on the completion of their training, restrict their practice of anesthesiology to dental procedures. Although there are a few dentists who entered the practice of medical anesthesiology years ago when there was a shortage of anesthesiologists (and whose continued acceptance is strictly a matter of local policy), further encroachment by dentists in this field must be discouraged.

Adequate training of dentists in general anesthesia requires a thorough indoctrination in the hospital operating room, accompanied by extensive experience in an outpatient clinic. It is highly desirable that a well-trained dentist anesthesiologist should work in cooperation with the physician anesthesiologists in the training program, since few physicians have been trained in the technics of general anesthesia for ambulatory patients. The dentist who pursues such training should be willing to devote at least one full year to it.

All efforts to elevate the standards of anesthesia in medicine and dentistry have a single objective: to provide better care for the patient. Both professions must keep this fact in mind as they approach the problems of the future.—*Bruce L. Douglas.*

■ Paresthesia of Lip

Q.—I have a patient with persistent paresthesia of the left side of the lower lip, a condition which followed a fracture of the mandible one year ago. Though there was moderate displacement at the time of injury, reduction was excellent and the fracture site is well healed. How do you explain the paresthesia and what can be done about it?

A.—If the bone fragments were well repositioned at the time of initial treatment, full return of sensation can be expected in from three to six months. Even in instances in which repositioning is poor, there is normally full regeneration of the inferior alveolar nerve though the time required is somewhat increased.

When sensation has failed to return in one year, it must be assumed that some abnormal situation has developed. At the fracture site there may be a region of sclerotic bone which has developed during the reparative process and this increased density may prevent the nerve from regenerating beyond this point. A cicatrix may have persisted at the site of fracture and this too could prevent complete regeneration.

Occasionally the nerve has become impinged at the site of fracture and though there may be regeneration from the posterior aspect, growth will not occur in the impinged region. When this happens, the patient may have pain, but he may still not have sensation in the lip. A neuroma may have formed at this site, which will account for the pain. A cicatrix which surrounds the nerve may also produce pain after regeneration has taken place.

When there is paresthesia of long standing or when there is bizarre pain after injury to the nerve, decompression of the nerve at the site of the injury must be considered. If sclerotic bone or a cicatrix is present, it should be removed in order to permit the nerve to grow forward. The excision of a neuroma may permit regeneration of the nerve.

■ Surgery for Fibrous Dysplasia

Q.—If a biopsy of a mandibular radiolucent region measuring approximately 0.5 cm. in all dimensions in a 17 year old girl was believed to be thoroughly removed by curettage, and the microscopic diagnosis was fibrous dysplasia, would more radical surgery be required at this time?

A.—On the basis of the roentgenographic observations and the clinical appearance at the time of surgery, the surgeon should at least suspect the possibility of fibrous dysplasia. Thorough curettage would naturally follow as in other procedures involving a radiolucent region. Fibrous dysplasia is a benign lesion, but does have a tendency to recur locally. This recurrence can be observed with regular postoperative roentgenographic studies. If there is a suggestion that the radiolucency has become larger, or if the defect has not filled in after a reasonable time, the region may be opened for reevaluation. Since fibrous dysplasia is thought by many to be an intermediate stage of an osteoma, it should not be surprising to find trabeculation in the operative site, with eventual increased calcification.

■ Temporomandibular Joint Trauma

Q.—Is it possible to produce trauma to the temporomandibular joint when removing teeth?

A.—Yes. When forceps or elevators are used, particular care should be exercised to stabilize the mandible with the other hand. Many times,

a patient will express some discomfort in the opposite temporomandibular joint. This would suggest inadequate support of the mandible or excessive force to one side.

If it is necessary to use a chisel and mallet or an automatic impactor, some method of support, such as a rubber bite block, is mandatory if injury to the joint is to be avoided. Some patients have a tendency to subluxate readily and extra precaution should be taken when working on these patients.

■ Determination of Blood Volume

Q.—How can circulating blood volume be estimated in a patient soon after a severe traumatic episode, so as to avoid an unnecessary transfusion of whole blood?

A.—This is a very important question. Every effort should be made to avoid transfusions, which are frequently more dangerous for a patient than anemia. In blood banks with well-kept statistics (these are also the blood banks which have well-trained personnel) the mortality rate is about three per thousand transfusions.

On the other hand, the only reliable evaluation of the need for transfusion results from a determination of the blood volume. Determination of hemoglobin, and the use of the hematocrit are of limited value, because with the trauma there may be a hemoconcentration which will give falsely high values. Some patients may have such a low total blood volume that not only the operation but also anesthesia may be contraindicated unless the blood volume is increased to normal volume with transfusions.

Determination of blood volume is also helpful in deciding if whole blood, packed red cells or plasma should be used, as indicated by a respective decrease of total blood volume, red cell volume or plasma.

The most practical method for blood volume determination is the Evans blue dye method, details of which can be found in all textbooks on clinical pathology.

■ Removal of Sequestrums

Q.—What is the treatment for a small sequestrum in an edentulous region in the mandible or maxilla: (1) when the osteolytic activity is limited to the crest of the alveolus, and (2) when the osteolytic activity is in the depth of bone with a fistulous tract extending to the surface.

A.—Generally, the removal of small sequestrums near the surface can be accomplished by reflecting a muccoperiosteal flap, removing the sequestrums and curetting the surrounding region. The flap can be repositioned tightly without any unfavorable sequelae.

When the osteolytic activity is in the depth of bone, an incision should be made designed to excise the fistulous tract. The region of sequestration should be exposed and the sequestrums removed. The region should be thoroughly curetted and if the defect is large and the adjacent bone dense, the wound should be dressed and allowed to heal from its depth; this is preferred to an attempt at a primary closure.

This section devoted to queries and comments from readers on topics of current interest to oral surgeons and general dental practitioners is edited by S. Elmer Bear, Department of Oral Surgery, Medical College of Virginia, Richmond, Va., to whom readers are invited to send their communications. The answers, prepared by competent consultants, do not necessarily represent the opinions of any official scientific organization. Your participation in this section is invited.
THE EDITOR

■ NEW AND NONOFFICIAL DRUGS 1959. A.M.A. Council on Drugs. 714 pages. Index. $3.35. Philadelphia, J. B. Lippincott Co., 1959.

New and Nonofficial Drugs (N.N.D.) contains descriptions of drugs which are commercially available, and which the Council on Drugs of the American Medical Association has evaluated. As might be expected, the great majority of drugs described in N.N.D. are clearly useful. However, established usefulness is not a necessary criterion for inclusion in N.N.D. The Council's policy in this respect is reflected in its statement of purposes, principles and procedure as follows: "The Council does not accept, endorse, recommend or guarantee any individual brand or preparation of a drug described in *New and Nonofficial Drugs*." Monographs for drugs which have been listed in N.N.D., U.S.P. or N.F. for 20 years are not continued in N.N.D., although they may be referred to in conjunction with descriptions of less well known preparations.

There have been no alterations in format in the 1959 edition. However, there have been many changes in content. Dental uses for drugs are mentioned to a greater extent than previously. The dosage statements have been improved, and many new dosage forms have been added. Statements of physical and chemical properties have been placed in some monographs which did not include such statements in the 1958 edition. The monographs for promethazine and poliomyelitis immune globulin (human) have been revised extensively. Possible dental uses for these drugs are discussed.

Forty-one new monographs have been added, many for drugs which can be used in dentistry. Two analgesics, two intravenous anesthetics, two local anesthetics, one skeletal muscle relaxant, one proteolytic enzyme, and five tranquilizers are among these. The book is 41 pages longer than its predecessor.

N.N.D. is always concise, critical, readable, reliable and, because of its annual revision schedule and the unusually broad sources from which its information is drawn, it is more nearly up-to-date than most books on drugs. It emphasizes actions, uses, side effects and dosage, and thus contains the kind of information which is most often of value to the practitioner.

The current edition will be a suitable addition to the library of any dental institution or practicing dentist.—*Donald A. Wallace.*

■ AUS DER GESCHICHTE DER HEILKUNDE (FROM THE HISTORY OF THE HEALING ARTS). By Ernst Königer. 92 pages with 50 illustrations. DM. 8.50. Munich, Prestel Verlag, 1958.

This booklet is the tenth of a series bearing the title "Pictures from the German Past." The author, therefore, does not attempt to give an exhaustive account of the history of the healing arts but prefers to relate, in an interesting manner, a historic narrative that traces the development of medicine, dentistry and related sciences from the pre-Christian era to about the end of the sixteenth century, mainly in Germany.

In a pleasant fashion, the author discusses the early beginning and the progress of some of the healing arts and describes the activity of the early physicians, surgeons, dentists and, last but not least, the barbers and charlatans.

The book contains 50 illustrations, some of them in color, which are reproductions of paintings and drawings dealing with medical and dental subjects that are in the possession of the German National Museum in Nuremberg. These illustrations, far more than the text, are of interest to the American reader. Among them are: (1) "The Toothbreaker at the Fair," a wood engraving by Hans Weiditz (1531); (2) "Dental Instruments," a drawing by Walter Ryff (1545); "Physician and Dentist," wood

engravings by Jost Amman (1568); (3) "Humanistic Allegory of the Healing Arts," a wood engraving by Hans Holbein, the Younger (1540); (4) "Philippus Aureolus Theophrastus Bombastus von Hohenheim," a portrait (etching) by Augustin Hirschvogel (1540); (5) "Instruments for Treatment of Fractures of the Skull," a wood engraving by Hans von Gersdorff (1528); (6) "Primitive Forceps and Pelicans," etchings and engravings (16th to 18th century); (7) "Caricature of a Surgeon," by an unknown artist of the sixteenth century, and many other historical pictures of medical subjects.

It is regrettable that this amusing little book, because it is written in German, will not have the wide circulation in this country that it deserves.—*Paul H. Glucksman.*

■ An Approach to Ethics. By Ethelbert Lovett, D.D.S. 74 pages with several line drawings. Baltimore, Waverly Press, Inc., 1958.

Here, in ten chapters, is a series of talks presented by the author to the students at the Baltimore College of Dental Surgery where Dr. Lovett is listed as a special lecturer in ethics. His approach to a subject which could be, to say the least, boring, is novel and refreshing, and one that holds the interest of the reader. Actually, his formula is simple—at least when you see it in print. Dr. Lovett puts it this way, "Appeal to the imagination and the area of moral responsibility is stimulated; tell the familiar story of ethics in an unfamiliar way and it will live; do not cloud the student's mind with too many details, but concentrate on the main idea and with the passage of time the message will sink in deeper and be reinforced."

This, indeed, is an important subject and one which we would all do well to review from time to time. It is my feeling that the author has dealt with this important topic in an excellent manner and covered the material more than adequately. Actually, the information he presents is not new, but possibly some of his thoughts will be new to many of us.

His opening words are to the student directly, and his final chapter is also directed to those in his lecture room. In between, his subject matter follows a logical pattern which contributes to ease of reading.

The fact that the drawings and charts are not particularly artistic actually adds to the quality of the text because of their informality. However, they are more than adequate because they catch the eye and convey the message. The general typography is adequate and does not detract from the readability of the material. All the technical demands of printing are met with satisfaction although, perhaps, there could be some improvement in the general layout.

This book should be read by all men—not just dentists, but all men. It contains a universal message on the basic subject of living. It is what it purposes to be—an approach to ethics.—*Theodore C. Levitas.*

■ Mirror to Physiology: A Self-Survey of Physiological Science. By R. W. Gerard, M.D., Ph.D., Sc.D. First edition. 372 pages with 9 figures and 149 tables. Appendix and index. $5. Washington, D. C., American Physiological Society, 1958.

The 12 chapters in this book survey comprehensively the status of physiology. Information has been collected and evaluated by a distinguished committee, and other societies probably will follow this example. This treatise should and probably will be added to the personal library of those interested in physiology. It contains valuable information for administrative officials and should be on the required reading list for graduate students in physiology.

Adequate information has been obtained to substantiate the author's conclusions. These data are presented in table form, as indicated by the number, with very informative explanations. Important areas are comprehensively covered, well organized and presented in a highly readable form.

This treatise should not be taken lightly and should serve as a guide for deans and administrative officers. The demand for physiologists is about 200 per year; however, one half

that number are graduated each year. Salary scales must be closely scrutinized since the demand is increasingly greater for government and for private industry.

Research support is more extramural and a larger fraction reaches medical schools. More support must be given to dental schools. The average age of physiologists is increasing at an alarming rate. Physiologists are now moving to the Northwest, South, and the West. They are publishing shorter papers at an average cost of $13,000 per paper.

Little interest is shown toward dental physiology. Dental schools should and must develop their own program in oral physiology.—*Jack G. Bishop.*

■ A HANDBOOK OF MEDICAL HYPNOSIS. By Gordon Ambrose, L.M.S.S.A., and George Newbold, M.B. Second edition. 270 pages. Index. Price $6.75. Baltimore, The Williams & Wilkins Co., 1958.

A concise handbook, excellently organized and written, this volume is directed primarily toward the student and practitioner of general medicine. Eight of its 11 chapters are devoted to the applications of hypnosis to general medicine, the neuroses, anesthesia, pediatrics, gynecology, obstetrics and dermatology. A skillful blending of appropriate case histories with reviews of the relevant literature, the integration of references and suggested reading within the chapters themselves, and an adequate index combine to make this book informative, practical and easy to read.

The three introductory chapters deal adequately with the history of medical hypnosis, the phenomena of the hypnotic state and the present legal aspects of hypnosis in Great Britain.

With the exception of two pages within the chapter relating to hypnosis in anesthesia, dentistry receives little attention. The dental student and practitioner will find the book valuable primarily because it offers an excellent survey of the therapeutic application of hypnosis and also presents a wide variety of practical induction technics. The pedodontist should find the lengthy chapter "Hypnosis in Pediatrics" of particular value in broadening his knowledge of the behavior disorders and psychogenic phenomena of children, and the hypnotic technics described can well be adapted to the treatment of the young dental patient.—*Wilbur O. Ramsey.*

■ NEW DIMENSIONS OF LEARNING IN A FREE SOCIETY. Seminar addresses, discussions, public lectures, inaugural address, delivered at the inauguration of Edward Harold Litchfield, twelfth Chancellor, University of Pittsburgh. 289 pages with illustrations. Index. Pittsburgh, University of Pittsburgh Press, 1958.

If a legitimate distinction can be made between "educationist" and "educator," then this volume is most pointedly addressed to the latter group and is a significant contribution to the general fields of knowledge. With impunity, one can very easily and accurately apply the adjective "distinguished" to each contributor and contribution to this challenging symposium of thought concerning the principal program offerings at the university level of our schools.

The publication of this book celebrates the inauguration of Edward Harold Litchfield as twelfth Chancellor of the University of Pittsburgh specifically, but in this reviewer's opinion, it marks a unique occasion on which several of our top educators have given pause to discuss and evaluate the aims of education as they apply to our institutions of higher learning. The roster of participants in this symposium is impressive and reads like a Who's Who among the nation's top educators.

Perhaps the current crop of Cassandras who decry the current "sad state of affairs" of our educational institutions should be sentenced to several hours of reading and serious study of these provocative and stimulating essays, for a renewal of their faith in the leadership of our colleges and universities would be a certain result.

A prominent spokesman has been assigned to discuss each of the important academic disciplines, the profession and the challenging aspects of graduate and continuation education;

there is also an important address on student affairs. "New Dimensions of Learning" very fittingly closes with three public addresses, one by Dr. Litchfield and bearing the title of the book.

Readers will be interested to find that each of the seminar addresses is followed by a transcript of the discussion which it provoked among a group of expert discussants. These were all chosen with care and represent some of the most competent and outstanding leaders in each of the major fields of learning.

"New Dimensions of Learning" will not be selected by your favorite book-of-the-month club as a current feature attraction, but it is this reviewer's considered opinion that some of your "must" reading of the moment might very well be tabled in favor of these significant and timely addresses on the theme of the disciplines and objectives of higher learning.—*B. F. Miller, III.*

■ Radiation Protection. By Carl B. Braestrup and Harold C. Wyckoff. 361 pages. Illustrated. Index. $10.50. Springfield, Ill., Charles C Thomas, 1958.

Here, at last, is a book written by experts in the field for professional users of radiation who are not specialists in radiation protection or in radiation physics.

The authors have covered all aspects of radiation protection in a very readable manner. They have been most successful in describing the principles and the methodology of radiation protection without encumbering the nonspecialist with the higher mathematics of radiation physics. Chapters are included on measurement of radiation, biological effects, shielding, atmospheric contamination and hazard control. The entire text is amply illustrated with clearly designed line drawings, charts and tables. Although the authors are internationally recognized in this field, each chapter is well documented with further references.

The dentist who is interested in extending his knowledge in this field could find no better text.—*Robert J. Nelsen.*

■ Dental Clinics of North America—Interrelationship of Oral and Systemic Disease. By Lester W. Burket, D.D.S., M.D., consulting editor, in collaboration with 24 coauthors. Three issues yearly. July 1958 issue. 270 pages with illustrations. Index. $14 yearly subscription. Philadelphia, W. B. Saunders Co., 1958.

As a part of a continuing symposium on varied dental topics, this volume carries on the excellent high standards and presentation of practical information. Dr. Burket states in his foreword; "The interrelationships between oral and systemic disease are many and significant, as the different articles in this volume will indicate. They should be recognized and understood by both the dentist and physician."

Never before have so many authors combined their abilities and experiences in the preparation of a single volume dealing with this important topic. The 19 contributions by 25 individuals represent outstanding medical and dental investigators, teachers and clinicians.

It is quite impossible in the limited space allotted, to review this book chapter by chapter. Suffice it to say, the material is enjoyable to read and review. The subject matter is well organized and arranged, so that specific information can be found easily. The text is presented in such a manner as to motivate those unfamiliar with the subject to become interested because of its clarity, simplicity and choice of topics. Most books which include subject matter of this sort fall short of their goal, by being either too technical or too simple.

The size and format of this book are the same as previous volumes in this series. In addition to some excellent illustrations, a small number of clear illustrative diagrams and color plates, a general index and many pertinent references are included.

This symposium should command the interest of any dental or medical clinician or investigator. These summaries provide knowledge of such value as to justify the acquisition of the book for those who want up-to-date information with a minimum expenditure of time.—*E. Alan Lieban.*

■ INVESTMENTS FOR PROFESSIONAL PEOPLE. By Robert U. Cooper, M.D., Revised edition. 315 pages. Index. $4.95. New York, The Macmillan Co., 1959.

Few professional people have acquired enough knowledge and experience in financial matters to enable them to plan intelligently a sound investment program suited to their own personalities and circumstances.

This book provides an up-to-date, sound and comprehensive guide to many types of investments open to professional people. The author, concerned with proper handling of investment problems and who, himself, made financial mistakes early in his career, explains in clear and simple terms how to select and what to expect from each type of investment.

In addition to listing sound investment policies to pursue, the author devotes his first 18 pages to suggestions whereby the professional man may widen the gap between expenses and income sufficiently to produce the savings essential to any investment program. This includes chapters on control of expenditures, differentiation between private and salaried practice, personality factors, office facilities, office location, office personnel, professional and financial records, determination of fees, collection of accounts and professional partnerships.

Chapter 2 gives adequate and highly useful advice on income taxes followed by information on all types of insurance, utilization of banking facilities, real estate, analysis of financial statements, bonds, preferred stocks, common stocks, investment funds, special investment opportunities, disposal of estates and finally a lucid description of how to develop the investment program best suited to you.

The only criticism this reviewer might have is of the author's advice that after an adequate insurance and savings bulwark has been provided, the professional man's portfolio should contain some "speculative holdings." It seems to me the average professional man should be fundamentally cautious and limit his funds to known conservative investments.

This book is well worth every professional man's reading. It provides valuable information whereby he can make the most of his investment possibilities and avoid embarrassing mistakes.—*Lloyd H. Dodd.*

■ SCHWEIZERISCHES MEDIZINISCHES JAHRBUCH 1959 (SWISS MEDICAL YEARBOOK 1959). Edited by Otto Leuch, M.D., and H. Egli, L.L.D. 554 pages with 30 illustrations. Index. Swiss francs 16.50. Basel, Benno Schwabe & Co., 1959.

In the recent issue of this yearbook, the material on the practice of general and specialized medicine (including dentistry and its specialties, pharmacology and veterinary medicine) in Switzerland is well organized and easy to use.

The first part consists of biographies of prominent Swiss scientists, a complete index to the Swiss medical and dental literature published in 1958, and three original articles: (1) "New Clinopathologic Ideas," by W. Löffler; (2) "Recently Developed Anesthetics, Sedatives and Hypnotics," by M. Bleuer and P. Waser, and (3) "Disturbances of the Carbohydrate Metabolism in Children," by E. Rossi.

The second part contains the directories of physicians, dentists, pharmacists and veterinarians, arranged geographically and alphabetically.

The third part contains a list of medical and dental educators, schools, hospitals and professional organizations.

The fourth part is devoted to federal and cantonal bureaus and offices associated with public health and social welfare.

The fifth part lists Swiss spas, educational institutes, homes for children and for aged people, and pharmaceutical preparations (and their indications).

The book is well written, attractively bound, excellently illustrated and printed. It can be recommended to practitioners and students who are interested in the present state of the health services in Switzerland. Because it is a useful reference work, this book should be in all medical and dental libraries.—*Paul H. Glucksman.*

■ TUMORS OF THE MINOR SALIVARY GLANDS. Robert L. Brown, M.D., Everett L. Bishop, M.D., and Herbert S. Girardeau, M.D. Cancer 12:40 Jan.-Feb. 1959.

Tumors of the minor or accessory salivary glands are similar histologically to those that arise in the major salivary glands but they represent a definite clinical entity because of their location and clinical characteristics. They occur most frequently in the palate, cheek, and tongue, but in this series they were also found in the lip, floor of the mouth, alveolar ridge, and mandible. They are slightly more common in women than in men and are more often detected in patients between 40 and 60 years of age.

Of 38 patients in this review, 14 had benign tumors, and in 24 patients the tumors were malignant. Thirteen of the benign tumors were mixed tumors; one was a papillary cystadenoma. Of the 24 patients with malignant tumors, three had malignant mixed tumors, five had mucoepidermoid carcinoma, and 16 had adenocarcinoma.

Minor salivary gland tumors usually appear first as a painless lump. Ulceration may occur later but is usually less extensive in relation to the size of the tumor than in squamous cell carcinoma of comparable size. Other symptoms depend on tne size, location, and histological characteristics of the tumor.

Treatment methods in this series have been surgical excision, radiation, or a combination of surgery and radiation. Surgery is the treatment of choice for tumors of minor salivary glands. When the adequacy of the excision is questionable or when the carcinoma is too extensive to permit surgical removal, radiation therapy should be given. It is of definite palliative value and in one case in this series effected a long term cure. Rehabilitation of patients with antral defects after wide excision is aided by the use of prosthetic dentures.

All of the 14 patients with benign tumors have remained free of recurrence; ten of them for more than five years. The patients with malignant mixed tumors were all free of carcinoma at the time of their death from unrelated causes. Of the five patients with mucoepidermoid carcinoma, all are living and well, three more than five years. Of the 16 patients with adenocarcinoma, three were seen in consultation only, three were given palliative radiation, and ten were treated by surgery or a combination of surgery and radiation. Of these, six are living and well; one for more than five years. Response to treatment can be correlated with the histological characterictics of the tumor and the clinical extent of disease.—*Myron Kaufman.*

■ A MODIFIED TECHNIQUE FOR CREATING A LOWER LINGUAL SULCUS. F. L. Ashley, M.D., A. N. Schwartz, M.D., D.D.S., and M. F. Dryden, D.D.S. Plast. & Reconstr. Surg. 22:204 Sept. 1958.

To aid the prosthodontist in the construction of dentures for atrophic alveolar processes, a surgical technic for deepening the lingual sulcus is utilized to aid in retention of lower dentures. A mucoperiosteal flap is elevated after an incision along the alveolar crest of the mandible, extending from its most posterior position on the right side past the midline to the most posterior extent on the left side. The mucoperiosteal flap so outlined contains all the vital structures which are present in this region of the floor of the mouth. A hair-free skin graft is utilized and is sutured to the anterior and medial portions of the mucoperiosteal flap. The sulcus is maintained by the use of a no. 18 French catheter which is held in place by through and through sutures to the external surface of the inferior portion of the mandible. —*Gilbert S. Small.*

■ CARBON-BLACK CARCINOMA OF STENSEN'S DUCT. Bernard Maisel, M.D.; Charles Pearce, M.D.; John Connolly, M.D., and John Pearce, M.D. A.M.A. Arch. Surg. 78:331 Feb. 1959.

The paucity of experiences and therapeutic guides in the literature concerning malignancy of the parotid duct is attributable to the rarity of this disease entity, only six cases having been reported. No instance of parotid duct malignancy in which carcinogenic constituents of carbon-black are implicated has heretofore been reported. The literature reports only one previous case of epidermoid carcinoma of the parotid duct. This was treated by local excision and radium, which did not effect a cure. Four cases of adenocarcinoma of the parotid duct have been reported. Three of these were treated with local excision and radium, with reported survival of from 3 to 20 years. The fourth case was treated by local excision but no follow-up is reported. All of these carcinomas occurred in men and women in the sixth and seventh decades of life. The one reported instance of sarcoma of Stensen's duct occurred in a 29 year old man. It was treated by radical excision with death occurring within a year.

Steiner, in experimental work on hydrocarbons, postulated that carbon-black, under certain circumstances, would eventually be found to produce cancer in man. This unusual case presented is believed to be a clinical substantiation of Steiner's prediction. Inasmuch as the polycyclic chemical contaminants of carbon-black are known carcinogens in animals and since it is well known that carcinomas on the skin can be induced by soot, it is plausible that the carbon-black produced the parotid duct cancer in this case.

The radical surgical care of carcinoma of Stensen's duct should involve excision of the parotid duct with a margin of cheek tissue and a margin of skin and buccal mucosa in continuity with the parotid gland. This should be followed by a radical neck lymph node dissection. The cosmetic result after radical surgical excision of cancer of the parotid duct is good. An acrylic prosthesis that fills the defect under the right cheek and carries the right upper maxillary denture was constructed in the reported case. This prosthesis has afforded the patient normal phonation. There is no evidence of recurrent carcinoma 20 months after surgery.—*Myron Kaufman.*

■ THE EFFECT OF CYCLOPROPANE PLUS HYPERCARBIA ON BLOOD CLOTTING. William Howland, M.D., M. B. Zucker, M.D., D. E. Cliffton, M.D., and C. P. Boyan, M.D. Anesthesiology 20:128 Jan.-Feb. 1959.

The mechanism of increased bleeding with cyclopropane has not been determined. In order to assess the effect of cyclopropane and cyclopropane plus hypercarbia on the clotting mechanism, a battery of clotting tests was performed before anesthesia, during the anesthesia, after rebreathing carbon dioxide for 15 minutes, and after anesthesia. These tests were the tourniquet tests, bleeding time, platelet count, clotting time glass, clotting time silicone, prothrombin time, prothrombin content, factor V activity, factor VII activity, prothrombin consumption, thromboplastin generation test, thrombin clotting time, fibrinogen concentration, fibrinolytic activity, whole blood clot lysis and antiplasmin activity.

Fifteen patients received cyclopropane for operations lasting one to two hours, and six patients undergoing two to three hour operations received cyclopropane with deliberately induced carbon dioxide levels of 56 to 62 mm. of mercury for a duration of 15 minutes. The only changes in blood clotting noticed were those in the fibrinolytic system. Fibrinolysis occurred in ten of the 21 cases studied but five of these showed preoperative fibrinolysis.

Thus only four of the patients receiving cyclopropane and one patient with hypercarbia developed intraoperative fibrinolysis. None of these patients showed increased bleeding at the operative site. This incidence of fibrinolysis is no different from that previously reported in a series of 38 cases receiving ether anesthesia. Thus it appears that the increased bleeding with cyclopropane anesthesia is not due to clotting disturbances.—*Irwin A. Small.*

■ The Combined Use of Narcotics and Narcotic Antagonists for Premedication. Henry Brunn, Jr., M.D., Francis F. Foldes, M.D., Pearl McNall, M.D., and Ludwig Koukal, M.D. Anesthesiology 20:122 Jan.-Feb. 1959.

Forty unselected surgical patients received intramuscularly 1.5 mg. per kilogram meperidine, 0.3 to 0.4 mg. scopolamine and 100 mg. of pentobarbital sodium about two hours before induction of anesthesia. Forty other patients, besides these drugs, were also given intramuscularly 0.02 mg. per kilogram levallorphan at the same time. At zero time, after topical anesthetization of the pharynx with 1 per cent tetracaine, pulse rate, blood pressure and respiratory rate were recorded and thiopental sodium 5 mgs. per kilogram was injected in two minutes through the rubber sleeve of an intravenous infusion. At two minutes, the administration of a four liter to one liter nitrous oxide-oxygen mixture was started through a face mask. At four minutes, the same parameters, together with the respiratory minute volume, measured with a Bennett ventilation meter, again were recorded. At five minutes, 20 patients of each group 1 and group 2 received 0.4 mgs. per kilogram alphaprodine and 20 others of group 1 and group 2 1 mg. per kilogram meperidine intravenously in 30 seconds. At 8 and 12 minutes, pulse rate, blood pressure, respiratory rate and minute volume were again recorded. If at the time of the eight minute reading, the patient was apneic, an additional 0.02 mg. per kilogram levallorphan was injected intravenously.

The administration of 5 mgs. per kilogram thiopental sodium caused little change in pulse rate, blood pressure or respiratory rate. The only difference observed between group 1, premedicated with meperidine alone and group 2, premedicated with meperidine plus levallorphan was an 8 per cent decrease of the respiratory rate in the former and a 5 per cent increase in the latter. Levallorphan used with the premedication offered some protection against the respiratory effects of both alphaprodine and meperidine; for example, apnea developed in 12 out of 20 patients of group 1 as contrasted with two out of 20 in group 2. Similarly the incidence of apnea was three and zero in groups 1 and 2 respectively.

The depression of the respiratory rate and respiratory minute volume in the patients who did not develop apnea after intravenous alphaprodine or meperidine was also less in group 2 premedicated with levallorphan plus meperidine. The results indicated that the intramuscular injection of 0.02 mg. per kilogram levallorphan afforded some protection against the respiratory depressant effects of large doses of narcotic analgesics administered intravenously two hours later. This protection, however, was less than that obtained when identical doses of levallorphan were injected intravenously immediately prior to, or after, the intravenous administration of identical doses of narcotic analgesics.—*Irwin A. Small.*

■ Carcinoma Arising in the Minor Salivary Gland Ducts of the Lower Lip. R. A. Keffler, N. Lemson and S. C. Sommers. Am. J. Surg. 97:79 Jan. 1959.

Carcinoma of the lip usually has a favorable prognosis. In reviewing six cases out of 140 of lip carcinoma, the diagnosis of carcinoma of salivary ductal epithelium was established. The clinical picture of this carcinoma resembles closely that of epidermoid carcinoma. The tumor is characterized by involvement of the mucous membrane surface of the lip without transitional change of the adjacent overlying epithelium. There is deep invasion and frequent lymphatic spread. The histologic picture is characterized by a sheetlike growth with undifferentiated malignant epithelium with occasional tubule and duct formation.

In reviewing the history of these cases, it is found that there was an increased likelihood of regional and distant metastases. In the treatment of this carcinoma, surgical excision should be used but the boundaries should extend beyond that routinely used. Probable nodes are present and neck dissection is indicated. The patient should be followed closely postoperatively, if no nodes are present clinically, for the possibility of recurrence. Radiation therapy is apparently ineffective.—*Gilbert S. Small.*

■ CARCINOMA OF THE FLOOR OF THE MOUTH: CLINICAL OBSERVATIONS IN SURGICAL TREATMENT. William F. MacFee, M.D. Ann. Surg. 149:172 Feb. 1959.

Carcinoma of the floor of the mouth is a relatively infrequent form of human cancer. It is, however, one of the more malignant forms of intraoral cancer. The tumor invades neighboring tissues by local extension and metastasizes to the lymph nodes of the neck in approximately 50 per cent of the cases. More distant metastasis may occur but is not common. The most effective treatment is surgical excision of the primary tumor and complete dissection of the lymph nodes on the corresponding side of the neck. If the cervical lymph nodes on the side of the primary tumor show involvement, dissection of the nodes on the opposite side should follow as soon as possible afterward. If the nodes on the side of the primary tumor do not show involvement, dissection of the nodes on the opposite side may be omitted, at least temporarily, but the patient should be kept under close observation for the possible appearance later of contralateral metastasis. The prognosis depends entirely upon whether the primary carcinoma and its metastatic implants have been completely removed.

Surgical extirpation of the carcinoma should not be more destructive of uninvolved tissues or more deforming than is necessary, and provisions should be made for restoring the patient as nearly as possible to his former appearance and functional state. From the statistics available on cancer of the floor of the mouth and tongue, it appears that approximately one third of the patients without metastasis survive and are free of recurrence for five years or more after surgical treatment, whereas the five year survival rate of those with metastasis is approximately one sixth or less. The over-all five year salvage rate is estimated to be about 25 per cent. The long-term results based on total salvage are not very encouraging, but cancer of the floor of the mouth, untreated or treated inadequately, is invariably a fatal disease. If the patient seeks advice early and receives foresighted, competent treatment, the results are in many instances gratifying, though not as frequently as would be desired. For best results the primary tumor must be removed early and completely, and the cervical lymph nodes on the side of the primary lesion must be considered involved, even in the absence of obvious metastasis, and treated accordingly.—*Myron Kaufman.*

■ STUDY OF 400 PREGNANCIES WITH BIRTH OF CLEFT PALATE INFANTS. L. A. Peer, M.D., L. P. Strean, Ph.D., J. C. Walker, Jr., M.D., W. G. Bernhard, M.D., and G. C. Peck, M.D. Plast. & Reconstr. Surg. 22:442 Nov. 1958.

Cleft palate deformity can be induced in mice by the injection of cortisone acetate into the pregnant female. A greater degree of protection was obtained when full acid was injected with cortisone acetate. The incidence of this congenital malformation in experimental animals may be increased by physiologic or psychologic stress, anoxia, or deficiency of certain vitamins.

Of 400 human pregnancies giving rise to offspring with cleft lip or cleft palate, or both, a history of similar deformities was found in only 23 per cent of the families.

These children with cleft lip and palate deformities are no more likely to be retarded than children without congenital deformities. A significant hearing loss, usually of middle ear origin, may be expected of these children.

There is no significant relationship between the age of the mother or father and the incidence of cleft palate or lip deformities. This is also true with Rh factor and blood groups of parents. In about three fourths of those histories taken, there was a negative family history for cleft lip and palate deformities. In over one half of these pregnancies no vitamins were taken, either late or irregularly. Based on the protective effect of vitamin B_6 and folic acid on cortisone-treated mice, further studies on subsequent pregnancies to determine the effectiveness of such medication in humans will be undertaken. The vitamin therapy should begin at least one month before planned pregnancy and be continued through the fourth month.—*Gilbert S. Small.*

■ Newer Concepts of Nutrition by the Intravenous Route. C. P. Artz, M.D. Ann. Surg. 149:841 June 1959.

One of the most important facts of adequate supportive care in a surgical patient is proper nutrition. When food can be taken orally and the digestive and absorptive process of the gastrointestinal tract is unimpaired, maintenance of an acceptable state of nutrition is not difficult. However, in patients in whom the oral route cannot be utilized, the nutritional needs of the patient may have to be given parenterally.

Generalized protein deficiency is commonly referred to as hypoproteinism. The manifestations of this condition are varied and most of them are undesirable in the surgical patient. Hypoproteinism may lead to any of the following: diminished tolerance to blood loss with increased susceptibility to shock, lowered antibody production and lowered resistance of infection and impaired wound healing, and tendency toward postoperative wound dehiscence, delayed healing of fractures, liver dysfunction and fatty infiltration of the liver, diminution of the plasma volume with an increase of interstitial fluid leading to a generalized tissue edema which may affect the gastrointestinal anastomosis with delayed emptying, weakness, lassitude, mental depression, and a diminution in the metabolic rate.

Intravenous solutions that supply protein include whole blood, plasma, albumin and protein hydrolysates. Of this group, protein hydrolysates seem to be the best, easiest and most economical method of administering protein intravenously. The important aspect of administering protein hydrolysates is that the administered protein will not be used with maximal efficiency unless caloric equilibrium is achieved. Calories may be supplied intravenously by the use of carbohydrate solutions, usually in the form of dextrose and fructose, alcohol or fat. A new intravenous fat preparation has been studied in its caloric content and clinical results evaluated. This solution of fat emulsion does supply an adequate caloric intake when used intravenously and few immediate side effects have been noticed. These side effects have been minor and include flushing, urticaria, chills and nausea. This has been seen in about 1 per cent of the patients. In long term infusions of large amounts of intravenous fat, liver function was impaired as revealed by bromsulfalein retention, cephalin flocculation and thymol turbidity tests. Because of these changes, it was suggested that hematocrit determinations should be performed every two to three days during therapy.

It is suggested that vitamin therapy which may be indicated should be given intramuscularly or subcutaneously to prevent wasteful urinary excretion of the vitamin. Metabolic balance studies have attested to the efficacy of a protein hydrolysate-fructose-alcohol solution and of intravenous fat emulsion for maintaining nitrogen equilibrium.—*Gilbert S. Small.*

■ The Surgical Treatment of Edentulous Prognathic Patients. Varaztad H. Kazanjian, M.D., D.M.D., and Edgar M. Holmes, M.D. Am. J. Surg. 96:833 Dec. 1958.

It is usually unnecessary to operate on persons who have a prognathic, edentulous mandible. A prosthodontist is able to construct good, functioning dentures which will solve the problem of mastication and sometimes better the patient's appearance. However, there are instances which are exceptions to this rule. They fall in two main categories: (1) the person who has a long and wide mandible associated with a maxillary arch so extremely small that functioning dentures are impossible and (2) the person who can have functioning dentures constructed but whose appearance is so abnormal that cosmetic improvement is desired.

In general, two main principles are employed in the correction of a prognathic jaw. One is sectioning of the ascending rami above the mandibular foramen or condylectomy permitting the whole jaw to be pushed posteriorly into a predetermined position. The other is to remove a premeasured section from both sides of the body of the mandible, permitting the anterior part to move posteriorly where it is united and held in position by some means of fixation.—*Myron Kaufman.*

■ SALIVARY GLAND TUMORS. G. G. Garcelon, M.D. A.M.A. Arch. Surg. 78:12 Jan. 1959.

Over a ten year period 172 patients were seen with salivary gland tumors. The most common tumor seen was the mixed salivary gland tumor. Carcinoma was seen in one out of every five parotid tumors and more than one half of the tumors of the submaxillary gland. Over one half of all tumors of salivary gland origin occurring in abnormal locations were carcinoma. Radical excision with exposure of the facial nerve in all tumors of the parotid gland may minimize the danger of facial nerve injury and produce few recurrences of mixed tumor. In the presence of regional lymph node metastasis, the opportunity for cure is decreased. All tumors of the submaxillary salivary gland should be considered malignant. In proved carcinoma, radical neck dissection is indicated. Radical initial surgery of salivary gland tumors in abnormal locations is indicated if a high percentage of cures is to result. Irradiation in the form of deep roentgen-ray therapy offers palliation. Estrogen alone or estrogen combined with radiation appears to have a place in palliative treatment of advanced carcinoma of the salivary glands.—*Gilbert S. Small.*

■ SIGNIFICANCE OF LIVER DYSFUNCTION IN MOUTH CANCER. N. Trieger, D.M.D., G. W. Taylor, M.D., and D. Weisberger, D.M.D., M.D. Surg., Gynec. & Obst. 108:230 Feb. 1959.

Oral cancer comprises about 5 per cent of all cancers. Squamous cell carcinoma of the mouth has been associated with syphilis, chronic irritation, carcinogenic tars, and the use of tobacco and alcohol. A study was undertaken to ascertain the relation of these predisposing factors. There were complete records of 68 patients to furnish adequate data on serologic examination, smoking, alcohol consumption, and physical and laboratory examination. It was noted that there was an incidence of 7.5 males to one female. It was noted that cirrhotics with mouth cancer have a 19 per cent five year survival rate; 40.3 per cent of those patients without cirrhosis survive at least five years. The average age for diagnosis of patients with hepatic cirrhosis and carcinoma is 57 years, whereas 70 years was the age of the patients without cirrhosis. Oral irritants play an important role in mouth cancer and the wearing of a dental prosthesis appears to protect the patient from carcinoma of the palate. Ninety-seven per cent of this group under study smoked more than one package of cigarettes per day. Seventy-five per cent drank alcohol to excess and 58.8 per cent had alcohol cirrhosis. Nine per cent of the total group had syphilis.

The concept of cocarcinogenesis in multiple causations in cancer of the mouth may be altered by the development of hepatic disease. The factors of carcinogenic tars and chronic oral irritants may be superimposed on the mucosal substrate to yield, with time, a carcinoma.—*Gilbert Small.*

■ THE USE OF THE WEBB BOLT AS A SPACE-MAINTAINING APPLIANCE IN DEFECTS OF THE MANDIBLE. J. M. Hamilton, M.D., and S. B. Hardy, M.D. Plast. & Reconstr. Surg. 22:296 Oct. 1958.

The Webb bolt is a threaded bolt with nuts and washers which is commonly used for fractures of the tibial plateau. It can be utilized to hold mandibular fragments apart after a surgical procedure involving resection. It has less tendency to erode through the mandible than does the ordinary Kirschner wire or the Steinman pin. Its small diameter makes closure without tension easier than with bulkier appliances and no teeth are necessary for fixation. The bolt is placed in prepared drill holes at the inferior portion of the mandible at the cut surface. Some adjustments usually can be made with the nut. The bolt offers immediate rigidity in defects of the mandible and is often tolerated for long periods of time. The appliance maintains the position of the fragments during the period of scar contracture and, if removed, the scar itself lends some stability to the oral structures. —*Gilbert S. Small.*

■ SECTION OF THE NEUROVASCULAR BUNDLE: ITS EFFECT ON PALATAL BULK. Thomas Ray Broadbent, M.D., and Albert E. Hochstrasser, M.D. Plast. & Reconstr. Surg. 23:607 June 1959.

Palatal bulk and length are considered important in the accomplishment of intelligible speech. Particularly is this so in the cleft palate child as well as in children with other organic palatal maladies. Evaluation of the closure and "push back" procedures, that is, the V-Y Wardill, stimulated concern for the necessity of a more careful technic that would avoid injury to nerves and vessels that might produce muscular paralysis or atrophy of mucous glands. Inasmuch as postoperative palatal paresis had not been noted clinically, the greatest concern lay in the innervation of the mucous glands of the hard and soft palate. One might suggest that atrophy from denervation would result in shrinking and shortening of palatal length and would increase the incidence of poor or even unintelligible speech in the child with a repaired cleft palate. Clinical observations have been made and animal (dog) experiments have been done in an effort to clarify this possibility.

Broomhead carried out investigations to ascertain the effect of nerve section on these glands in rats. He noted no adverse effect on the mucous glands when the descending palatine nerves were sectioned.

The left neurovascular bundle, including all descending palatine nerves, was sectioned in the experimental animals (dogs). The right served as control. In addition to the animal experiments two 20 month old patients who had repairs in which the neurovascular bundle was sectioned on the left side were studied.

Section of the descending palatine nerves failed to produce gross or microscopic atrophy of the mucous glands or the muscular tissue in any of the animal studies. Paralysis was not noted.

In the human patients the control or normal side was 3 and 3.5 mm. longer respectively than on the sectioned side. Thickness of the palate grossly was comparable or only slightly thinner on the sectioned side. Secretory activity under ether stimulation is considerably decreased. These observations in humans were originally expected but were unsubstantiated by the animal experiment.

It can be assumed that in the process of palatal closure and lengthening, the neurovascular pedicle, including the three descending palatine nerves and greater palatine vessels, should be preserved to avoid atrophy of mucous glands, decrease in palatal bulk, shortening of the palate and decreased speech efficiency.—*Donald B. Rae.*

■ PAPILLARY CYSTADENOMA OF ACCESSORY SALIVARY GLAND. Edmund M. Collins, D.D.S., M.D. Am. J. Surg. 96:749 Dec. 1958.

Papillary cystadenoma is a tumor which may arise in any glandular tissue in the body but is most commonly found in the ovary and the thyroid gland. In the salivary glands it most often involves the parotid and less often the submaxillary gland. Its occurrence in the accessory salivary glands lining the oral cavity is relatively rare and has been reported infrequently. A case of papillary cystadenoma of an accessory salivary gland was studied. This is a rare and potentially malignant lesion as is evidenced by its recurrence in this case six and one-half years after it was first observed. When encountered it should be treated with radical removal and the patient should be treated with as great care as any other patient in whom a malignant tumor is found.—*Myron Kaufman.*

■ MINIMIZING POSTOPERATIVE ECCHYMOSIS. Howard B. Rasi, M.D., D.D.S. Am. J. Surg. 96:751 Dec. 1958.

In the hope of obtaining better results in the control of capillary ooze during rhinoplasty and submucous septectomy, the author treated 53 patients with carbazochrome salicylate. This was given preoperatively as well as postoperatively and was found to effectively control capillary ooze and shorten the postoperative period of ecchymosis. It is conceivable that the findings in the use of this drug can be applicable to oral surgery.—*Myron Kaufman.*

■ CLINICAL EXPERIENCES WITH FLUOTHANE. J. S. Carson and others. Ann. Surg. 149:100 Jan. 1959.

Fluothane is being investigated as a general anesthetic agent by anesthesiologists for an evaluation of its complete anesthetic properties. In this clinical study 500 patients, for a variety of surgical procedures, received Fluothane. Fluothane was used along with oxygen and in combination with a barbiturate, a muscle relaxant, and nitrous oxide and combinations of these agents. Clinical observations were noted from the point of view of induction, maintenance, effects on the cardiovascular system and respiration, muscle relaxation and liver function. The recovery time also was evaluated.

The main advantages of Fluothane were found to be potency, noninflammability and nonexplosiveness, compatibility with soda lime, pleasantness to the patient, the fact that it can be given with other anesthetic agents, diminished secretions, diminished nausea and vomiting, and a rapid recovery. The disadvantages included its potency, circulatory depression, respiratory depression, incomplete muscle relaxation except with deep anesthesia, difficulty in assessing the depth of anesthesia, and possible expense.

Fluothane is not well suited for the occasional anesthetist or for those unfamiliar with the technics of modern general anesthesia and, as with any anesthetic, the facilities for immediate resuscitation must be available.—*Gilbert Small.*

■ THE METABOLIC ACIDOSIS OF HYPERVENTILATION PRODUCED BY CONTROLLED RESPIRATION. C. N. Papadopoulos, M.D., and Arthur Keats, M.D. Anesthesiology 20:156 March-April 1959.

Twenty patients undergoing general anesthesia for orthopedic or gynecological surgical procedures were deliberately hyperventilated by controlled manual ventilation. The duration of hyperventilation in 15 patients was one hour and in five patients four hours. Arterial blood was sampled at frequent intervals and the changes in the acid-base balance were followed during hyperventilation. Severe hyperventilation with respiratory alkalosis and carbon dioxide tensions of 15 to 20 mm. of mercury were associated with a small increase in total fixed acids as indicated by the corrected bicarbonate values in the blood-buffered base. Blood lactic acid also increased and all changes progressed with increased duration of hyperventilation. No significant alterations occurred in plasma potassium sodium and chloride. The metabolic acidosis which follows respiratory alkalosis is the result of tissue compensatory mechanisms and not the result of tissue hypoxia from vasoconstriction and alteration in the oxygen dissociation curve.—*Irwin A. Small.*

■ MALIGNANT ANGIOBLASTOMA OF LONG BONE; A RE-APPRAISAL OF ADAMANTINOMA OF LONG BONES. G. Changus, J. Speed, and F. Stewart. Cancer 10:540 May and June 1957.

The rare and perplexing tumor involving the limb bones, especially the tibia, which closely simulates the adamantinomas found in the jaw bones, has provoked various theories concerning its genesis. After sufficient presumptive evidence on the angioblastic origin of these tumors was obtained from routine hematoxylin-and-eosin-stained sections, confirmatory evidence was obtained by subjecting fresh, unfixed, angioblastic tibial tumors to the histochemical phosphatase procedure. Two fresh, unfixed adamantinomas of the mandible were subjected to the same histochemical phosphatase procedure. The tumor cells of the adamantinoma did not take up the black staining alkaline phosphatase.

On the basis of these and other histochemical technics the vascular genesis of the adamantinoma of long bones has been demonstrated and the epithelial origin of these unique tumors has been disproved. Twenty-five of 27 cases of adamantinoma of the long bones have been reclassified. The designation of "malignant angioblastoma of bone" has been applied to these unique tumors.—*Irwin A. Small.*

■ Polyurethane Polymer, Its Use in Osseous Lesions. J. E. Salvatore and M. P. Mandarino. Ann. Surg. 149:107 Jan. 1959.

The substance described is a form of "bone glue." Ideal characteristics of such a substance should include the properties of low tissue reactivity. Promotion of new bone formation, adhesiveness, strength, torsional stability, nontoxicity, and ease of handling. This mixture is applied between the osseous surfaces to be bonded where it rapidly hardens into a foamy, white, porous, immobilizing agent. The adhesive properties of polyurethane foam are decreased in the presence of excess blood or moisture so that its use may be restricted to those anatomic areas where adequate hemostasis by tourniquet or other established hemostatic technics may be applied. Experimental work was done on animals and histologic sections were taken. There were 11 oblique femoral fractures in nine animals and the results were excellent. In three instances of dorsal spinal fusion, one failure was reported. In three dogs, cystic areas in the femur were filled with polyurethane foam with excellent results.

Grossly and microscopically, polyurethane foam was absorbed slowly by the body from its site of implantation with approximately one fourth of the original implant remaining in 12 months. Further study along pharmacologic and toxicologic evaluations is continuing.—*Gilbert S. Small.*

■ A Clinical Approach to Parotid Gland Tumors. Wilber C. Sumner, M.D. Ann. Surg. 149:852 June 1959.

The treatment of neoplasms of the parotid gland is essentially a surgical problem. It is generally agreed that irradiation as the primary treatment of these tumors is of little value. Occasionally radiation therapy may be used as an adjunct to surgical excision.

The separation of these tumors into the clinical classification of (1) encapsulated, (2) invasive, and (3) recurrent, is suggested. Tumors which are encapsulated and benign constitute 65 to 70 per cent of all parotid gland tumors. These may be excised without sacrificing the facial nerve. They include papillary cystadenoma lymphomatosum, mixed tumors, oxyphil cell adenoma, benign lymphoepithelial lesions, mucoepidermoid, low grade, malignant mixed tumors, early, and adenocystic, early.

Malignant tumors which are clinically encapsulated, constitute an additional 15 per cent and in the remaining 15 to 20 per cent sacrifice of all of the major portion of the nerve will be required, necessitating some form of facial rehabilitation. These include squamous cell carcinoma, mucoepidermoid carcinoma, high grade, adenocarcinoma, and malignant mixed tumors. —*Irwin A. Small.*

■ Thirty-nine and Thirty-eight Year Follow-up of Mandibular Bone Grafts in Three Cases. R. H. Ivy, M.D., D.D.S., and J. D. Eby, D.D.S. Plast. & Reconstr. Surg. 22:548 Dec. 1958.

Three cases are discussed in which mandibular bone grafts were used to replace missing bone after trauma in two patients, and a postoperative surgical defect from excision of a tumor in the third. All three bone grafts are in place and the patients are functioning well. Ilium grafts were utilized as the source of this bone. It is postulated that this bone over the years has not been absorbed and replaced by new bone but is the original bone that was placed. This is based on roentgenographic examination made at intervals during the periods of consolidation. The opinion is also expressed that massive cancellous iliac bone grafts are superior to dense cortical grafts from the tibia. Grafts were placed through an extraoral incision without entrance into the oral cavity. They were held in place by silver wire ligatures. Dental prostheses were subsequently made to maintain the patient's occlusion. All three patients now enjoy good health with satisfactory function and appearance.—*Gilbert S. Small.*

Announcements

■ Fourth Annual Clinical Conference to be Held in Houston

Seven guest speakers will participate in the fourth annual clinical conference sponsored by the University of Texas M. D. Anderson Hospital and Tumor Institute and the University of Texas Postgraduate School of Medicine. The subject of the conference, scheduled for November 13 and 14, is "Tumors of the Head and Neck." There will be no fee for attendance at the conference for those who are not working for credits.

■ University of Illinois Announces Oral Surgery Courses

The College of Dentistry of the University of Illinois is accepting applications for two and three year full time courses in oral surgery beginning July 1960. Both programs carry credit toward a Master of Science degree.

Further information can be obtained from Dr. Daniel M. Laskin, Department of Oral and Maxillofacial Surgery, University of Illinois, 808 S. Wood St., Chicago 12.

■ New York Hospital Seeks Intern, Residency Applications

The dental and oral surgery service of the Mount Sinai Hospital in New York City announces that it is accepting applications for internships and residencies for the calendar year beginning July 1960.

Applications should be made as soon as possible since selections are generally made in December. They can be sent to Dr. Max Fuchs, Assistant Director, The Mount Sinai Hospital, 11 East 100th St., New York 29.

■ W. B. Dunning, Co-founder of Columbia School of Oral Surgery, Dies

William Bailey Dunning, 85, a founder in 1915 of the Columbia School of Dental and Oral Surgery, which is now part of the Columbia-Presbyterian Medical Center in New York, died July 21.

With his brother, Henry S. Dunning, William Gies, and Samuel Liebert, Dr. Dunning helped to found the Columbia School and served as chairman of the Faculty of Dentistry.

He was a former editor of the *Journal of the Allied Dental Societies*, a Fellow of the American College of Dentists and former president of the New York Academy of Dentistry.

■ Fund for Dental Education Gives Grant for Conference

A grant of $1,145 was given to the American Society of Oral Surgeons by the Fund for Dental Education. It was used to conduct the second planning conference on graduate training in oral surgery held September 8 at the Biltmore Hotel, New York. Some of the money will also be used for dissemination of the definitive data resulting from the conference.

■ Postgraduate Course in Anatomy of the Head and Neck

The Medical College of Virginia, School of Dentistry, announces a five-day postgraduate course in the anatomy of the head and neck April 14-18, 1960, under the direction of Alton D. Brashear, professor of anatomy.

The course will include a dissection by course participants of the head and neck regions. Clinical application to problems in oral surgery and in prosthodontics will be emphasized. The class is limited to ten persons and the fee is $75.

Index to Journal of Oral Surgery, Anesthesia and Hospital Dental Service

1959

A

ACCIDENTS
See Anesthesia—accidents during
ACTINOMYCOSIS
Lesney, T. A. and Traeger, K. A. Cervicofacial actinomycosis: a postextraction complication 51 Jan.
ADAMANTINOMA
See Ameloblastoma
ADRIANI, JOHN. Fundamentals of general anesthesia for students and practitioners of dentistry (Book rev.) 85 July
AGED
See Geriatrics; See also Ill and aged, Dentistry for
ALLERGY
Diphenhydramine hydrochloride as protection from allergic reactions during blood transfusion 81 May
PENICILLIN: See Penicillin—reaction to
ALLISON, M. L. Organization of the hospital dental service in a large teaching hospital 47 Mar.
AMBROSE, GORDON AND NEWBOLD, GEORGE. Handbook of medical hypnosis (Book rev.) 70 Nov.
AMELOBLASTOMA
Changus, G., et al. Malignant angioblastoma of long bone; a re-appraisal of adamantinoma of long bones 80 Nov. Abstract
Smith, D. C. Growth and the ameloblastoma: report of case 75 May
AMERICAN HOSPITAL ASSOCIATION
Anderson, Joseph. American Hospital Association, its basic organization and objectives with special reference to hospital dentistry 53 Mar.
AMERICAN SOCIETY OF ORAL SURGEONS
FitzGerald, L. M. American Society of Oral Surgeons: factors contributing to its birth, growth and present status in the health field 20 Sept.
AMES, M. I. AND LOSCALZO, L. J.: See Loscalzo, L. J.
ANALGESIA
NITROUS OXIDE
Douglas, B. L. and Kresberg, Harold. Use of regional anesthesia with general analgesia in oral surgery practice 83 Sept.
ANATOMY
ORAL
Terminology changes of the head and neck 92 Sept.
ANDERSON, JOSEPH. American Hospital Association, its basic organization and objectives with special reference to hospital dentistry 53 Mar.
ANESTHESIA
Strean, L. P. Stress phenomenon as related to surgical anesthesia 42 July
ACCIDENTS DURING
Cooke, F. N. Oral surgeon's responsibility in cardiac arrest 14 Mar.
ANESTHESIA AND ANESTHETICS, GENERAL
CYCLOPROPANE
Howland, William, et al. Effect of cyclopropane plus hypercarbia on blood clotting 74 Nov. Abstract
FLUOTHANE
Carson, J. S., et al. Clinical experiences with Fluothane 80 Nov. Abstract
INTRAVENOUS
Weyl, Ruth, et al. Clinical evaluation of a new ultra-short-acting oxygen barbiturate for intravenous anesthesia 90 July Abstract
ANESTHESIA AND ANESTHETICS, HISTORY
Revzin, Marvin. Anesthesia: history's answer to man's need 49 Sept.
ANESTHESIA AND ANESTHETICS, LOCAL
Douglas, B. L. and Kresberg, Harold. Use of regional anesthesia with general analgesia in oral surgery practice 83 Sept.
Walker, R. V. Sterilization of anesthetic cartridges in office practice 48 Nov.
ANESTHETISTS
EDUCATION: See Medicine—education; See also Education, dental
ANGELO, J. J. AND BENTZEL, G. W. T. Unusual cartiliginous tumor of the symphysis of the mandible 87 May Abstract
ANOXEMIA
See Anesthesia—accidents during
ANTIBIOTICS
See also Penicillin
Antibiotic resistant microorganisms 89 Jan.; comment 81 May
Degnan, E. J. Use and abuse of antibiotics in dentistry 43 Nov.
Haberman, Sol. Disinfection, antibiosis and sterilization in modern dentistry 33 Nov.
Nunn, D. B. and Parker, E. F. Albamycin in the treatment of surgical infections 89 Mar. Abstract
Possible major changes in the field of antibiotics in the not too distant future 84 July
ANTIENZYMES
See Enzymes
ANTISEPTICS, GERMICIDES
See also Sterilization and asepsis
ANTRUM
See Sinuses of face

APICOECTOMY
Periapical pathosis in teeth which are in direct relation to the maxillary sinus need not exclude them as candidates for a root resection 84 July
ARAICHE, MANAWEL AND BRODE, HERBERT: See Brode, Herbert
ARCHAMBAULT, G. F. Hospital pharmacy-hospital dentistry relationships 22 Mar.
ARCHER, W. H. Manual of dental anesthesia (Book rev.) 84 Mar.
ARTHROPLASTY
See Mandible and maxilla—resection
ARTZ, C. P. Newer concepts of nutrition by the intravenous route 77 Nov. Abstract
ASEPSIS, DENTAL
See Sterilization and asepsis
ASHLEY, F. L., et al. Modified technique for creating a lower lingual sulcus 73 Nov. Abstract
ASPHYXIA
DURING ANESTHESIA: See Anesthesia—accidents during
ATARAXICS
Tranquilizers and premedication for dental patients 82 July
AVERY, J. K.; HOEK, R. B. AND COSTICH, E. R.: See Hoek, R. B.
AZZATO, NICHOLAS AND PROWLER, J. R.: See Prowler, J. R.

B

BACTERIOLOGY
Quinn, E. L. Hospital staphylococcus (Ed.) 78 May
BALDUZZI, GIOVANNI. Carcinoma of the lips, tongue and floor of mouth 86 Mar. Abstract
BARBITURATES
Weyl, Ruth, et al. Clinical evaluation of a new ultra-short-acting oxygen barbiturate for intravenous anesthesia 90 July Abstract
BAURMASH, HAROLD; FAGGELLA, FRANCIS AND MANDEL, LOUIS: See Mandel, Louis
BELL, W. E. Armamentarium for surgery in office practice 52 Nov.
BELL, W. H. Histologic study of heterogenous bone implants in human beings: preliminary report 3 Mar.
BELL'S PALSY
See Palsy—Bells
BENIGN TUMORS
See Tumors
BENTZEL, G. W. T. AND ANGELO, J. J.: See Angelo, J. J.
BERGSMA, DANIEL. Public exposure to ionizing radiation (Book rev.) 85 May
BERNIER, J. L.; GODBY, F. AND BHASKAR, S. N.: See Bhaskar, S. N.
BHASKAR, S. N.; BERNIER, J. L. AND GODBY, F. Aneurysmal bone cyst and other giant cell lesions of the jaws. Report of 104 cases 30 July
BLACK, B. M. Tumors of the parathyroid glands 86 Mar. Abstract
BLOOD
COAGULATION: See also Hemorrhage—control
Howland, William, et al. Effect of cyclopropane plus hypercarbia on blood clotting 74 Nov. Abstract
TRANSFUSION
Determination of blood volume 67 Nov.
Diphenhydramine hydrochloride as protection from allergic reactions during blood transfusion 81 May
BLOOM, H. J. AND SMALL, I. A.: See Small, I. A.
BLUE CROSS AND BLUE SHIELD
See Insurance—hospital
BONE
DISEASES: See also Dysplasia—osseous; Mandible and maxilla—diseases; Necrosis
Coley, Bradley, et al. Giant-cell tumor of bone 88 Mar. Abstract
GRAFTS
Bell, W. H. Histologic study of heterogenous bone implants in human beings: preliminary report 3 Mar.
Henny, F. A. and McClelland, W. D., Jr. Methods of fixation in mandibular bone grafts 34 May
Ivy, R. H. and Eby, J. D. Thirty-nine and thirty-eight year follow-up of mandibular bone grafts in three cases 81 Nov. Abstract
Salvatore, J. E. and Mandarino, M. P. Polyurethane polymer, its use in osseous lesions 81 Nov. Abstract
REGENERATION
Dresser, W. J. and Clark, H. B., Jr. Study of tissue response to polyvinyl resin sponge implants in the jaws of dogs 3 Nov.
TRANSPLANTS: See—grafts, listed above
BOOK REVIEWS
Adriani, John. Fundamentals of general anesthesia for students and practitioners of dentistry 85 July
Ambrose, Gordon and Newbold, George. Handbook of medical hypnosis 70 Nov.
American Medical Association—Council on Drugs. New and nonofficial drugs 1959 68 Nov.
Archer, W. H. Manual of dental anesthesia 84 Mar.
Bergsma, Daniel. Public exposure to ionizing radiation 85 May
Braestrup, C. B. and Wyckoff, H. C. Radiation protection 71 Nov.
Brinkhous, K. M. (Edited by) Hemophilia and hemophilioid diseases 83 Mar.
Cooper, R. U. Investments for professional people 72 Nov.
Dental clinics of North America—interrelationship of oral systemic disease 71 Nov.
Dental Clinics of North America—tumors of the oral region 82 May
Ellinger, Friedrich. Medical radiation biology 82 Mar.
Engstrom, Arne, et al. Bone and radiostrontium 84 May
Foldes, Francis. Muscle relaxants in anesthesiology 90 Jan.
Gerard, R. W. Mirror to physiology: a self-survey of physiological science 69 Nov.
Goldman, H. M., et al. Introduction to periodontia 93 Sept.
Goldman, L. B. There is an answer to cancer 84 May
Grossman, L. I. (Edited by) Handbook of dental practice 85 July
Köniğer, Ernst. Aus der Geschichte der Heilkunde (From the history of the healing arts) 68 Nov.
Langer, Erich. Histopathologie der Tumoren der Kiefer und der Mundhoehle. (Histopathology of the tumors occurring in the areas of the jaws and the oral cavity) 88 July
Leuch, Otto and Egli, H. (Edited by) Schweizerisches medizinisches Jahrbuch (Swiss medical yearbook 1959) 72 Nov.
Lovett, Ethelbert. Approach to ethics 69 Nov.
Marti-Ibañez, Felix. Men, molds, and history 88 July
Mayer, D. M. and Swanker, W. A. Anomalies of infants and children 87 July
Meyer, Irving. Osteoradionecrosis of the jaws 86 July
Montgomery, G. L. Pathology for students of dentistry 83 May
National Bureau of Standards. Safe handling of bodies containing radioactive isotopes 84 May

NATO. Emergency war surgery 82 May
New dimensions of learning in a free society 70 Nov.
Noeppel, O. Pharmacologie et pharmacotherapie dentaire. (Pharmacology and dental pharmacotherapy) 87 July
Peterson, Shailer. (Edited by) Clinical dental hygiene 93 Sept.
Stafne, E. C. Oral roentgenographic diagnosis 84 Mar.
Thoma, K. H. Oral surgery 82 Mar.
Trelease, S. F. How to write scientific and technical papers 86 July
Tylman, S. D., et al (Edited by) Year book of dentistry: 1957-1958 series 83 May
Vallery-Radot, Pasteur. Louis Pasteur 83 Mar.
BORKENHAGEN, ROBERT AND KOWAL, ROLAND. Necrotizing states of the maxilla 89 May Abstract
BRAESTRUP, C. B. AND WYCKOFF, H. C. Radiation protection (Book rev.) 71 Nov.
BRINKHOUS, K. M. (Edited by) Hemophilia and hemophilioid diseases (Book rev.) 83 Mar.
BROADBENT, T. R. AND HOCHSTRASSER, A. E. Section of the neurovascular bundle: its effect on palatal bulk 79 Nov. Abstract
BRODE, HERBERT AND ARAICHE, MANAWEL. Nasopalatine cyst: report of a case 64 July
BROWN, R. L., et al. Tumors of the minor salivary glands 73 Nov. Abstract
BRUNN, HENRY, JR., et al. Combined use of narcotics and narcotic antagonists for premedication 75 Nov. Abstract
BURCH, R. J. AND FUNK, E. C. Treatment of oroantral fistula: report of case 58 Nov.
BURS
See Extraction—instruments
BYARS, L. T., et al. Tumors of salivary gland origin in children; a clinical pathological appraisal of 24 cases 88 Mar. Abstract

C

CADMUS, R. R. Hospital staff and interprofessional relations 37 Mar.
CALCIFIC DEPOSITS
See Calculus—salivary
CALCULUS
SALIVARY
Oringer, M. J. Removal of submaxillary gland sialoliths by intraoral incision with electrosection 17 May
CAMERON, J. R. Development of the specialty of oral surgery in the past century 14 Sept.
CANCER
Lane, Stanley. Branchiogenic cyst carcinoma 89 May Abstract
METASTASIS
Kinsey, D. L., et al. Study of metastatic carcinoma of the neck 89 Mar. Abstract
ORAL: See also Tumors
Balduzzi, Giovanni. Carcinoma of the lips, tongue and floor of mouth 86 Mar. Abstract
Chaudry, A. P., et al. Primary malignant melanoma of the oral cavity—a review of 105 cases 89 July Abstract
Keffler, R. A., et al. Carcinoma arising in the minor salivary gland ducts of the lower lip 75 Nov. Abstract
Loscalzo, L. J. and Ames, M. I. Oral carcinoma: some clinical diagnostic problems with early lesions 40 May
MacFee, W. F. Carcinoma of the floor of the mouth: clinical observations in surgical treatment 76 Nov. Abstract
Maisel, Bernard, et al. Carbon-black carcinoma of Stensen's duct 74 Nov. Abstract
Perzik, S. L., et al. End results in carcinoma of the oral cavity 90 Mar. Abstract
Shedd, D. P., et al. Survey of tongue cancer over a fifteen year period in a general hospital 87 Mar. Abstract
Tebo, H. G. and Serling, J. M. Loss of the lamina dura in hyperparathyroidism due to carcinoma: report of a case 68 May
Trieger, N., et al. Significance of liver dysfunction in mouth cancer 78 Nov. Abstract
Van Zile, W. N. Carcinoma in a healing alveolus after a dental extraction: report of case 82 Jan.
Wigand, F. T. Simultaneous carcinoma of upper and lower lip: report of case 78 Jan.
CARBAZOCHROME SALICYLATE
See Hemorrhage—control
CARCINOMA
See Cancer; See also Tumors
CARNES, J. C. Chronic desquamative gingivitis: report of case 69 July
CARSON, J. S., et al. Clinical experiences with Fluothane 80 Nov. Abstract
CHAIKIN, BERNARD; FOX, LEWIS; GOLDMAN, H. M.; SCHLUGER, SAUL AND COHEN, D. W.: See Goldman, H. M.
CHANGUS, G., et al. Malignant angioblastoma of long bone; a re-appraisal of adamantinoma of long bones 80 Nov. Abstract
CHAUDRY, A. P. AND HOLLAND, M. R.: See Holland, M. R.
CHAUDRY, A. P., et al. Primary malignant melanoma of the oral cavity—a review of 105 cases 89 July Abstract
CHEILITIS
See Lip—lesions
CHEMOTHERAPY
See Antibiotics
CHRONIC ILLNESS
DENTAL CARE DURING: See Ill and aged, Dentistry for
CLARK, H. B., JR. AND DRESSER, W. J.: See Dresser, W. J.
CLEFT PALATE AND CLEFT LIP
Peer, L. A., et al. Study of 400 pregnancies with birth of cleft palate infants 76 Nov. Abstract
SURGICAL TREATMENT
Broadbent, T. R. and Hochstrasser, A. E. Section of the neurovascular bundle: its effect on palatal bulk 79 Nov. Abstract
Kilner, T. P. Management of the patient with cleft lip and/or palate 85 Mar. Abstract
COHEN, D. W.; CHAIKIN, BERNARD; FOX, LEWIS; GOLDMAN, H. M. AND SCHLUGER, SAUL: See Goldman, H. M.
COLBY, R. A. AND GERRY, R. G. Mixed tumor of floor of mouth in a seven year old child: report of case 75 Jan.
COLEY, BRADLEY, et al. Giant-cell tumor of bone 88 Mar. Abstract
COLLINS, E. M. Papillary cystadenoma of accessory salivary gland 79 Nov. Abstract
CONDYLE
See Temporomandibular joint
COOKE, F. N. Oral surgeon's responsibility in cardiac arrest 14 Mar.
COOKSEY, D. E. AND MIDDLETON, R. A. Management of oral surgical problems complicated by maxillary sinus involvement 14 Jan.
COOPER, R. U. Investments for professional people (Book rev.) 72 Nov.
COSTICH, E. R.; AVERY, J. K. AND HOEK, R. B.: See Hoek, R. B.
CRAGH, LYLE, et al. Osteogenic sarcoma of the jaws and facial bones 90 Mar. Abstract
CROWE, W. W. Neurilemmoma of the tongue: report of case 65 Mar.; Treatment of zygomatic fracture-dislocations 27 Jan.
CROWLEY, R. E. Dental findings in neuropsychiatric patients 73 Sept.

CURETTAGE
Curetting periapical lesions 80 Mar.
CURTIN, J. W. AND GREELY, P. W.: See Greely, P. W.
CYCLOPROPANE
See Anesthesia and anesthetics, general—cyclopropane
CYSTS
See also Ameloblastoma
Bhaskar, S. N., et al. Aneurysmal bone cyst and other giant cell lesions of the jaws. Report of 104 cases 30 July
Brode, Herbert and Araiche, Manawel. Nasopalatine cyst: report of a case 64 July
Collins, E. M. Papillary cystadenoma of accessory salivary gland 79 Nov. Abstract
Mandel, Louis, et al. Mucous cysts: report of case 61 Mar.
Standish, S. M. and Shafer, W. G. Mucus retention phenomenon 15 July

D

DEGNAN, E. J. Use and abuse of antibiotics in dentistry 43 Nov.
DENTISTRY
RELATION TO MEDICINE: See Medicine—relation to dentistry
DENTISTS
IN HOSPITALS: See Hospitals—dental service; See also Internships and residencies, dental
DENTURES
LESIONS CAUSED BY
Hoyne, R. M., et al. Tetanus complicated by impacted dentures: report of case 59 July
SURGICAL PREPARATION FOR
Ashley, F. L., et al. Modified technique for creating a lower lingual sulcus 73 Nov. Abstract
DIATHERMY AND SURGICAL DIATHERMY IN DENTISTRY
Oringer, M. J. Removal of submaxillary gland sialoliths by intraoral incision with electrosection 17 May
DIET AND NUTRITION
Artz, C. P. Newer concepts of nutrition by the intravenous route 77 Nov. Abstract
DINGMAN, R. O. Hemangiopericytoma 91 Mar. Abstract
DIPHENHYDRAMINE HYDROCHLORIDE: See Blood—transfusion
DISINFECTION AND DISINFECTANTS
See Sterilization and asepsis
DOUGLAS, B. L. Importance of cooperation between medicine and dentistry in the field of anesthesiology (Ed.) 64 Nov.
AND KRESBERG, HAROLD. Use of regional anesthesia with general analgesia in oral surgery practice 83 Sept.
DRESSER, W. J. AND CLARK, H. B., JR. Study of tissue response to polyvinyl resin sponge implants in the jaws of dogs 3 Nov.
DROTER, J. A. Transitory Bell's phenomenon after mandibular injection: report of case 57 July
DRUGS
Brunn, Henry, Jr., et al. Combined use of narcotics and narcotic antagonists for premedication 75 Nov. Abstract
DUNCAN, R. H. Dental service in the small hospital 51 Mar.
DYSPLASIA
See also Endocrine glands and hormones
OSSEOUS: See also Bone—diseases
Surgery for fibrous dysplasia 66 Nov.

E

EBY, J. D. AND IVY, R. H.: See Ivy, R. H.
EDEMA
Schneider, Paul. Postoperative edema and its reduction by trypsin 49 May
Stuteville, O. H., et al. Trypsin in the treatment of swellings of the head and neck—a preliminary report 87 May Abstract
EDITORIALS
Douglas, B. L. Importance of cooperation between medicine and dentistry in the field of anesthesiology 64 Nov.
Henny, F. A. Century of progress 91 Sept.; Dental internship 63 Nov.; Hospital dental service 79 Mar.; Journal of Oral Surgery assumes a new and more comprehensive title 86 Jan.; The other side of the coin 80 July
Quinn, E. L. Hospital staphylococcus 78 May
Taylor, R. W. Asepsis in minor oral surgical procedures: a re-evaluation 87 Jan.
EDUCATION, DENTAL
Douglas, B. L. Importance of cooperation between medicine and dentistry in the field of anesthesiology (Ed.) 64 Nov.
INTERNSHIPS: See Internships and residencies, dental
SPECIALISTS
Fauber, J. E. Specialty boards in dentistry and educational programs in hospitals 33 Mar.
EGLI, H. AND LEUCH, OTTO: See Leuch, Otto
ELECTROSURGERY
See Diathermy and surgical diathermy in dentistry
ELLINGER, FRIEDRICH. Medical radiation biology (Book rev.) 82 Mar.
ENDOCRINE GLANDS AND HORMONES
Strean, L. P. Stress phenomenon as related to surgical anesthesia 42 July
RELATION TO ORAL CONDITIONS
Tebo, H. G. and Serling, J. M. Loss of the lamina dura in hyperparathyroidism due to carcinoma: report of a case 68 May
ENGSTROM, ARNE, et al. Bone and radiostrontium (Book rev.) 84 May
ENZYMES
Schneider, Paul. Postoperative edema and its reduction by trypsin 49 May
Stuteville, O. H., et al. Trypsin in the treatment of swellings of the head and neck—a preliminary report 87 May Abstract
EXAMINING BOARDS
SPECIALTIES: See Licensure—specialists
EXODONTIA
See Extraction
EXTRACTION
IMPACTED TEETH
Hall, R. M. Surgical removal of impacted teeth using air turbine unit 3 May
INSTRUMENTS
Hall, R. M. Surgical removal of impacted teeth using air turbine unit 3 May
PARESTHESIA FOLLOWING
Persistent paresthesia 88 Jan.
POSTOPERATIVE COMPLICATIONS AND CARE
Lesney, T. A. and Traeger, K. A. Cervicofacial actinomycosis: a postextraction complication 51 Jan.

F

FAGGELLA, FRANCIS; MANDEL, LOUIS AND BAURMASH, HAROLD: See Mandel, Louis
FAUBER, J. E. Specialty boards in dentistry and educational programs in hospitals 33 Mar.

FIBROMA
See also Sarcoma
Staples, W. R. Ossifying fibroma of the mandible: report of case 68 Mar.
FISTULA
Burch, R. J. and Funk, E. C. Treatment of oroantral fistula: report of case 58 Nov.
Kiehn, C. L., et al. Repair of parotid fistulas 88 May Abstract
FITZGERALD, L. M. American Society of Oral Surgeons: factors contributing to its birth, growth and present status in the health field 20 Sept.
FLANAGAN, VIOLA AND MYERS, J. I.: See Myers, J. I.
FLAPS
See Oral surgery—graft and flap operation
FLUOTHANE
See Anesthesia and anesthetics, general—Fluothane
FOLDES, FRANCIS. Muscle relaxants in anesthesiology (Book rev.) 90 Jan.
FOOD AND DIETETICS
See Diet and nutrition
FOREIGN BODIES
IN ORAL TISSUES
Panagopoulos, A. P. Foreign bodies in maxillofacial surgery 89 July Abstract
FOX, LEWIS; GOLDMAN, H. M.; SCHLUGER, SAUL; COHEN, D. W. AND CHAIKIN, BERNARD: See Goldman, H. M.
FRACTURES
Crowe, W. W. Treatment of zygomatic fracture-dislocations 27 Jan.
Jarabak, J. P. Use of the Foley catheter in supporting zygomatic fractures 39 Jan.
JAWS: See also Maxillofacial injuries
Giammusso, A. P. and Johnson, W. B. Management of a subcondylar fracture: report of case 67 Jan.
Hamilton, J. M. and Hardy, S. B. Use of the Webb bolt as a space-maintaining appliance in defects of the mandible 78 Nov. Abstract
Robinson, Marsh. Intelligent consent for treating subcondylar fractures in children 46 May
Thoma, K. H. Treatment of jaw fractures, past and present 30 Sept.
FRANK, V. H. Paresthesia: evaluation of 16 cases 27 Nov.
FREEMAN, BROMLEY. Sialography in children 89 July Abstract
FUNK, E. C. AND BURCH, R. J.: See Burch, R. J.

G

GALAGAN, D. J. Look around the corner—what is ahead in hospital care 8 May
GARCELON, G. G. Salivary gland tumors 78 Nov. Abstract
GENERAL ANESTHETICS
See Anesthesia and anesthetics, general
GERARD, R. W. Mirror to physiology: a self-survey of physiological science (Book rev.) 69 Nov.
GERIATRICS
See also Ill and aged, Dentistry for
GERODONTOLOGY
See Geriatrics; See also Ill and aged, Dentistry for
GERRY, R. G. AND COLBY, R. A.: See Colby, R. A.
GIAMMUSSO, A. P. AND JOHNSON, W. B. Correction of a prognathic mandible: report of case 70 May; Management of a subcondylar fracture: report of case 67 Jan.
GILCHRIST, R. K. AND McANDREW, J. R. Surgical parotitis 86 May Abstract
GINGIVITIS
Carnes, J. C. Chronic desquamative gingivitis: report of case 69 July
GLANDULAR DISTURBANCES
See Endocrine glands and hormones
GLANZ, S. Treatment of traumatic facial injuries 85 Mar. Abstract
GODBY, F.; BHASKAR, S. N. AND BERNIER, J. L.: See Bhaskar, S. N.
GOLDMAN, H. M.; SCHLUGER, SAUL; COHEN, D. W.; CHAIKIN, BERNARD AND FOX, LEWIS. Introduction to periodontia (Book rev.) 93 Sept.
GOLDMAN, L. B. There is an answer to cancer (Book rev.) 84 May
GOODSELL, J. O. History of the origins and progress of the Journal of Oral Surgery 3 Sept.
GRAFTS
See also Oral surgery—graft and flap operation; Implants
BONE: See Bone—grafts
GRANULOMAS AND GRANULOMATOUS AREAS
Curetting periapical lesions 80 Mar.
GREELY, P. W. AND CURTIN, J. W. Papillary cystadenoma lymphomatosum (Warthin's tumor) 91 Mar. Abstract
GREEN, H. G. Mandibular protrusion: report of cases 71 Jan.
GROSSMAN, L. I. (Edited by) Handbook of dental practice (Book rev.) 85 July

H

HABERMAN, SOL. Disinfection, antibiosis and sterilization in modern dentistry 33 Nov.
HALL, R. M. Surgical removal of impacted teeth using air turbine unit 3 May
HAMILTON, J. M. AND HARDY, S. B. Use of the Webb bolt as a space-maintaining appliance in defects of the mandible 78 Nov. Abstract
HANSEN, L. S. Diagnosis of oral keratotic lesions 60 Jan.
HARDY, S. B. AND HAMILTON, J. M.: See Hamilton, J. M.
HARELIP
See Cleft palate and cleft lip
HAYWARD, J. R. Malignant giant cell tumor of the mandible: report of case 75 July
HEART FAILURE DURING ANESTHESIA
See Anesthesia—accidents during
HEMOPHILIA
Wishart, C., et al. Dental extractions in haemophilia 86 Mar. Abstract
HEMORRHAGE
CONTROL
Rasi, H. B. Minimizing postoperative ecchymosis 79 Nov. Abstract
HENNY, F. A. Century of progress (Ed.) 91 Sept.; Dental care planning in hospitals 18 Nov.; Dental internship (Ed.) 63 Nov.; Hospital dental service (Ed.) 79 Mar.; Journal of Oral Surgery assumes a new and more comprehensive title (Ed.) 86 Jan.; Present and future problems in oral surgery 66 Sept.; The other side of the coin (Ed.) 80 July
AND McCLELLAND, W. D., JR. Methods of fixation in mandibular bone grafts 34 May
HEPATITIS
Trieger, N., et al. Significance of liver dysfunction in mouth cancer 78 Nov. Abstract
HERPES
Jarabak, J. P. Herpes zoster of the mandibular division of the trigeminal nerve: report of case 57 May
HISTOLOGIC STUDIES—TEETH AND TISSUES
Bell, W. H. Histologic study of heterogenous bone implants in human beings: preliminary report 3 Mar.
Kerr, D. A. Epithelial neoplasms of the salivary glands: their histology and their behavior 1 July

HOCHSTRASSER, A. E. AND BROADBENT, T. R.: See Broadbent, T. R.
HOEK, R. B.; COSTICH, E. R. AND AVERY, J. K. Terminology in the field of tooth plantation 46 July
HOLLAND, M. R. AND CHAUDRY, A. P. Mixed tumor of the palate: report of case 58 May
HOLMES, E. M. AND KAZANJIAN, V. H.: See Kazanjian, V. H.
HOSPITAL INTERNSHIPS FOR DENTISTS
See Internships and residencies, dental
HOSPITALS
Quinn, E. L. Hospital staphylococcus (Ed.) 78 May
DENTAL SERVICE: See also Institutional dental service; Internships and residencies, dental
Allison, M. L. Organization of the hospital dental service in a large teaching hospital 47 Mar
Archambault, G. F. Hospital pharmacy-hospital dentistry relationships 22 Mar.
Cadmus, R. R. Hospital staff and interprofessional relations 37 Mar.
Duncan, R. H. Dental service in the small hospital 51 Mar.
Galagan, D. J. Look around the corner—what is ahead in hospital care 8 May
Henny, F. A. Dental care planning in hospitals 18 Nov.; Hospital dental service (Ed.) 79 Mar.
Hospitalization of dental patients 80 May
Kleinman, H. Z. Dental care of hospitalized mental patients 48 July
Tanchester, David. Organization and scope of dentistry in hospitals 27 Mar.
GROUP INSURANCE: See Insurance—hospital
HOWLAND, WILLIAM, et al. Effects of cyclopropane plus hypercarbia on blood clotting 74 Nov. Abstract
HOYNE, R. M.; THOMPSON, E. C. AND WILKINSON, H. W. Tetanus complicated by impacted dentures: report of case 58 July
HUBBELL, A. O.
AND McVEIGH, J. B.: See McVeigh, J. B.
AND WAGNER, W. A.: See Wagner, W. A.
HUEBSCH, R. F. Use of freeze-dried bone for treatment of nonunion after surgical correction of mandibular prognathism 44 Jan.

I

IVY, R. H. AND EBY, J. D. Thirty-nine and thirty-eight year follow-up of mandibular bone grafts in three cases 81 Nov. Abstract
ILL AND AGED, DENTISTRY FOR
Crowley, R. E. Dental findings in neuropsychiatric patients 73 Sept.
IMPACTED TEETH
See Teeth—impacted; See also Extraction—impacted teeth
IMPLANTATION
Hoek, R. B., et al. Terminology in the field of tooth plantation 46 July
Myers, J. I. and Flanagan, Viola. Long-range postoperative evaluation of transplanted hamster second molars 22 July
NATURAL TEETH
Replantation of evulsed teeth 82 July
Technic of replantation of the cuspid 89 Jan.
IMPLANTS
See also Grafts
Dresser, W. J. and Clark, H. B., Jr. Study of tissue response to polyvinyl resin sponge implants in the jaws of dogs 3 Nov.
Lane, S. L., et al. Vitallium implant for transected portion of the mandible 90 May Abstract
INFECTION
Quinn, E. L. Hospital staphylococcus (Ed.) 78 May
PERIAPICAL: See Periapical infection
INSTITUTIONAL DENTAL SERVICE
See also Hospitals—dental service
Crowley, R. E. Dental findings in neuropsychiatric patients 73 Sept.
INSTRUMENTS AND APPLIANCES
See also Oral surgery—instruments
CARE: See also Sterilization and asepsis
INSURANCE
HOSPITAL
Uhler, I. V. How Blue Shield has affected my practice 52 July
INTERNSHIPS AND RESIDENCIES, DENTAL
See also Hospitals—dental service
Fauber, J. E. Specialty boards in dentistry and educational programs in hospitals 33 Mar.
Henny, F. A. Dental internship (Ed.) 63 Nov.
INTRAVENOUS ANESTHESIA
See Anesthesia and anesthetics—general, intravenous

J

JARABAK, J. P. Herpes zoster of the mandibular division of the trigeminal nerve: report of case 57 May
Use of the Foley catheter in supporting zygomatic fractures 39 Jan.
JAWS
FRACTURES: See Fractures—jaws
JOHNSON, W. B. AND GIAMMUSSO, A. P.: See Giammusso, A. P.
JOURNAL OF ORAL SURGERY, ANESTHESIA AND HOSPITAL DENTAL SERVICE
Goodsell, J. O. History of the origins and progress of the Journal of Oral Surgery 3 Sept.

K

KAZANJIAN, V. H. AND HOLMES, E. M. Surgical treatment of edentulous prognathic patients 77 Nov. Abstract
KEATS, ARTHUR AND PAPADOPOULOS, C. N.: See Papadopoulos, C. N.
KEFFLER, R. A., et al. Carcinoma arising in the minor salivary gland ducts of the lower lip 75 Nov. Abstract
KEIM, W. F. Management of recurrent mixed tumors of the major salivary glands 87 May Abstract
KIEHN, C. L., et al. Repair of parotid fistulas 88 May Abstract
KILNER, T. P. Management of the patient with cleft lip and/or palate 85 Mar. Abstract
KINSEY, D. L., et al. Study of metastatic carcinoma of the neck 89 Mar. Abstract
KLEINMAN, H. Z. Dental care of hospitalized mental patients 48 July
KÖNIGER, ERNST. Aus der Geschichte der Heilkunde (From the history of the healing arts) (Book rev.) 68 Nov.
KOWAL, ROLAND AND BORKENHAGEN, ROBERT: See Borkenhagen, Robert
KRESBERG, HAROLD AND DOUGLAS, B. L.: See Douglas, B. L.

L

LANE, S. L. Branchiogenic cyst carcinoma 89 May Abstract
AND SCHWARZ, ALFRED. Infantile hemangioendothelioma of the parotid gland 88 May Abstract
LANE, S. L., et al. Vitallium implant for transected portion of the mandible 90 May Abstract

LANGER, ERICH. Histopathologie der Tumoren der Kiefer und der Mundhoehle. (Histopathology of the tumors occurring in the areas of the jaws and the oral cavity) (Book rev.) 88 July
LESIONS
CAUSED BY DENTURES: See Dentures—lesions caused by
OF MOUTH: See Mouth—lesions; See also Lip—lesions
LESNEY, T. A. AND TRAEGER, K. A. Cervicofacial actinomycosis: a postextraction complication 51 Jan.
LEUCH, OTTO AND EGLI, H. (Edited by) Schweizerisches medizinisches Jahrbuch (Swiss medical yearbook 1959) (Book rev.) 72 Nov.
LEWIS, MILES AND QUINN, J. H.: See Quinn, J. H.
LICENSURE
SPECIALISTS
Fauber, J. E. Specialty boards in dentistry and educational programs in hospitals 33 Mar.
LIP
CLEFT: See Cleft palate and cleft lip
LESIONS
Keffler, R. A., et al. Carcinoma arising in the minor salivary gland ducts of the lower lip 75 Nov. Abstract
Wigand, F. T. Simultaneous carcinoma of upper and lower lip: report of case 78 Jan.
LOCAL ANESTHETICS
See Anesthesia and anesthetics, local
LOCKJAW
See Tetanus
LOSCALZO, L. J. AND AMES, M. I. Oral carcinoma: some clinical diagnostic problems with early lesions 40 May
LOVETT, ETHELBERT. Approach to ethics (Book rev.) 69 Nov.

M

MacFEE, W. F. Carcinoma of the floor of the mouth: clinical observations in surgical treatment 76 Nov. Abstract
MACROGLOSSIA
See Tongue
MAISEL, BERNARD, et al. Carbon-black carcinoma of Stensen's duct 74 Nov. Abstract
MALIGNANT TUMORS
See Tumors; See also Cancer
MALKIN, MORTON: WEINSTEIN, ISADORE AND SHERMAN, PINCUS. Posttraumatic cervical pain syndrome: report of case 72 July
MALPRACTICE
Robinson, Marsh. Intelligent consent for treating subcondylar fractures in children 46 May
MANDARINO, M. P. AND SALVATORE, J. E.: See Salvatore, J. E.
MANDEL, LOUIS; BAURMASH, HAROLD AND FAGGELLA, FRANCIS. Mucous cysts: report of case 61 Mar.
MANDIBLE AND MAXILLA
DISEASES: See also Necrosis
Bhaskar, S. N., et al. Aneurysmal bone cyst and other giant cell lesions of the jaws. Report of 104 cases 30 July
FRACTURES: See Fractures—jaws; See also Maxillofacial injuries
RESECTION
Giammusso, A. P. AND Johnson, W. B. Correction of a prognathic mandible: report of case 70 May
Green, H. G. Mandibular protrusion: report of cases 71 Jan.
Huebsch, R. F. Use of freeze-dried bone for treatment of nonunion after surgical correction of mandibular prognathism 44 Jan.
Kazanjian, V. H. and Holmes, E. M. Surgical treatment of edentulous prognathic patients 77 Nov. Abstract
MARTI-IBAÑEZ, FELIX. Men, molds, and history (Book rev.) 88 July
MATERIA MEDICA AND THERAPEUTICS
See also Antibiotics
MAXILLA
See Mandible and maxilla; See also Maxillofacial injuries
MAXILLARY SINUS
See Sinuses of face
MAXILLOFACIAL INJURIES
See also Fractures—jaws
Crowe, W. W. Treatment of zygomatic fracture-dislocations 27 Jan.
Glanz, S. Treatment of traumatic facial injuries 85 Mar. Abstract
MAYER, D. M. AND SWANKER, W. A. Anomalies of infants and children (Book rev.) 87 July
McANDREW, J. R. AND GILCHRIST, R. K.: See Gilchrist, R. K.
McCLELLAND, W. D., JR. AND HENNY, F. A.: See Henny, F. A.
McVEIGH, J. B. AND HUBBELL, A. O. Succinylcholine chloride in oral surgery practice 30 May
MEDICINE
RELATION TO DENTISTRY
Douglas, B. L. Importance of cooperation between medicine and dentistry in the field of anesthesiology (Ed.) 64 Nov.
Henny, F. A. The other side of the coin (Ed.) 80 July
MENTAL HEALTH
Crowley, R. E. Dental findings in neuropsychiatric patients 73 Sept.
MENTAL PATIENTS
Kleinman, H. Z. Dental care of hospitalized mental patients 48 July
METABOLISM
Papadopoulos, C. N. and Keats, Arthur. Metabolic acidosis of hyperventilation produced by controlled respiration 80 Nov. Abstract
METASTASIS
See Cancer—metastasis
METHOCARBAMOL: See Muscle relaxants
MEYER, IRVING. Osteoradionecrosis of the jaws (Book rev.) 86 July
MICROGLOSSIA
See Tongue
MIDDLETON, R. A. AND COOKSEY, D. E.: See Cooksey, D. E.
MONTGOMERY, G. L. Pathology for students of dentistry (Book rev.) 83 May
MOUTH
LESIONS
Hansen, L. S. Diagnosis of oral keratotic lesions 60 Jan.
MUSCLE RELAXANTS
McVeigh, J. B. and Hubbell, A. O. Succinylcholine chloride in oral surgery practice 30 May
Methocarbamol (Robaxin) is an effective nontoxic medication for the relief of muscle spasm 81 May
MYERS, J. I. AND FLANAGAN, VIOLA. Long-range postoperative evaluation of transplanted hamster second molars 22 July

N

NECROSIS
See also Bone—diseases
Borkenhagen, Robert and Kowal, Roland. Necrotizing states of the maxilla 89 May Abstract
NEOPLASMS
See Tumors
NERVES
Broadbent, T. R. and Hochstrasser, A. E. Section of the neurovascular bundle: its effect on palatal bulk 79 Nov. Abstract

NEURALGIA
TRIGEMINAL; TRIFACIAL; TIC DOULOUREUX
Jarabak, J. P. Herpes zoster of the mandibular division of the trigeminal nerve: report of case 57 May
NEVUS
Scofield, H. H. Blue (Jadassohn-Tieche) nevus: a previously unreported intraoral lesion 4 Jan.
NEWBOLD, GEORGE AND AMBROSE, GORDON: See Ambrose, Gordon
NITROUS OXIDE
See Anesthesia and anesthetics, general—nitrous oxide; See also Analgesia—nitrous oxide
NOEPPEL, O. Pharmacologie et pharmacotherapie dentaire. (Pharmacology and dental pharmacotherapy) 87 July
NOMENCLATURE
Terminology changes of the head and neck 92 Sept.
DENTAL
Hoek, R. B., et al. Terminology in the field of tooth plantation 46 July
NUNN, D. B. AND PARKER, E. F. Aibamycin in the treatment of surgical infections 89 Mar. Abstract
NUTRITION
See Diet and nutrition

O

ORAL SURGERY
Cooksey, D. E. and Middleton, R. A. Management of oral surgical problems complicated by maxillary sinus involvement 14 Jan.
Henny, F. A. Present and future problems in oral surgery 66 Sept.
Oringer, M. J. Removal of submaxillary gland sialoliths by intraoral incision with electrosection 17 May
Removal of sequestrums 67 Nov.
GRAFT AND FLAP OPERATION
Mandibular lingual flap 80 Mar.
HISTORY
Cameron, J. R. Development of the specialty of oral surgery in the past century 14 Sept.
Henny, F. A. Century of progress (Ed.) 91 Sept.
INSTRUMENTS
Bell, W. E. Armamentarium for surgery in office practice 52 Nov.
RELATION TO PROSTHETICS: See Dentures—surgical preparation for
ORINGER, M. J. Removal of submaxillary gland sialoliths by intraoral incision with electrosection 17 May
OSSEOUS DYSPLASIA
See Dysplasia—osseous
OSTEOTOMY
See Mandible and maxilla—resection
OXYGEN
THERAPY
Weyl, Ruth, et al. Clinical evaluation of a new ultra-short-acting oxygen barbiturate for intravenous anesthesia 90 July Abstract

P

PAIN
CONTROL: See—prevention and control, listed below
DIAGNOSIS: See also Neuralgia
Malkin, Morton, et al. Posttraumatic cervical pain syndrome: report of case 72 July
PREVENTION AND CONTROL
Control of pain without narcotics 80 Mar.
Wagner, W. A. and Hubbell, A. O. Pain control with a mixture containing dextro propoxyphene hydrochloride, a mixture containing codeine phosphate and a placebo 14 Nov.
PALATE
CLEFT: See Cleft palate and cleft lip
PALSY
BELLS
Droter, J. A. Transitory Bell's phenomenon after mandibular injection: report of case 57 July
PANAGOPOULOS, A. P. Foreign bodies in maxillofacial surgery 89 July Abstract
PAPADOPOULOS, C. N. AND KEATS, ARTHUR. Metabolic acidosis of hyperventilation produced by controlled respiration 80 Nov. Abstract
PARALYSIS, FACIAL
See also Palsy—Bells
PARESTHESIA
See Extraction—paresthesia following
Frank, V. H. Paresthesia: evaluation of 16 cases 27 Nov.
Paresthesia of lip 66 Nov.
PARKER, E. F. AND NUNN, D. B.: See Nunn, D. B.
PAROTITIS
Gilchrist, R. K. and McAndrew, J. R. Surgical parotitis 86 May Abstract
PEER, L. A., et al. Study of 400 pregnancies with birth of cleft palate infants 76 Nov. Abstract
PENICILLIN
Possible major changes in the field of antibiotics in the not too distant future 84 July
Topical use of penicillin 83 July
REACTION TO
Penicillin substitutes for allergic patients 83 July
Spiegel, L. H. Penicillinase treatment of allergic penicillin reactions 27 May
PERIAPICAL INFECTION
See also Granulomas and granulomatous areas
Periapical pathosis in teeth which are in direct relation to the maxillary sinus need not exclude them as candidates for a root resection 84 July
PERIODICALS
DENTAL
Goodsell, J. O. History of the origins and progress of the Journal of Oral Surgery 3 Sept.
Henny, F. A. Journal of Oral Surgery assumes a new and more comprehensive title (Ed.) 86 Jan.
PERZIK, S. L., et al. End results in carcinoma of the oral cavity 90 Mar. Abstract
PETERSON, SHAILER. (Edited by) Clinical dental hygiene (Book rev.) 93 Sept.
PHARMACY
Archambault, G. F. Hospital pharmacy-hospital dentistry relationships 22 Mar.
PINS
See Fractures—jaws
POSTOPERATIVE COMPLICATIONS AND CARE
See Extraction—postoperative complications and care
PREMEDICATION
Brunn, Henry, Jr., et al. Combined use of narcotics and narcotic antagonists for premedication 75 Nov. Abstract
Tranquilizers and premedication for dental patients 82 July
PROGNATHISM
See Mandible and maxilla—resection
PROWLER, J. R. AND AZZATO, NICHOLAS. Chondrosarcoma of the mandible: report of case 62 May

Q

QUINN, E. L. Hospital staphylococcus (Ed.) 78 May
QUINN, J. H. AND LEWIS, MILES. Bilateral inverted supernumerary central incisors penetrating nasal cavity: report of case 61 Nov.

R

RASI, H. B. Minimizing postoperative ecchymosis 79 Nov. Abstract
RELATION OF MEDICINE TO DENTISTRY
See Medicine—relation to dentistry
REPLANTATION OF TEETH
See Implantation—natural teeth
RESECTION OF MANDIBLE AND MAXILLA
See Mandible and maxilla—resection
RESIDENCIES, DENTAL
See Internships and residencies, dental
RESINS
Dresser, W. J. and Clark, H. B., Jr. Study of tissue response to polyvinyl resin sponge implants in the jaws of dogs 3 Nov.
REVZIN, MARVIN. Anesthesia: history's answer to man's need 49 Sept.
ROBAXIN
See Muscle relaxants
ROBINSON, MARSH. Intelligent consent for treating subcondylar fractures in children 46 May
ROOTS
RESECTION: See Apicoectomy

S

SALIVARY CALCULUS
See Calculus—salivary
SALIVARY GLANDS
DISEASES: See also Parotitis
Freeman, Bromley. Sialography in children 89 July Abstract
Turner, D. D. Virchow's metamorphosis of the salivary glands 91 Mar. Abstract
TUMORS: See Tumors
SALVATORE, J. E. AND MANDARINO, M. P. Polyurethane polymer, its use in osseous lesions 81 Nov. Abstract
SARCOMA
See also Tumors
Cragh, Lyle, et al. Osteogenic sarcoma of the jaws and facial bones 90 Mar. Abstract
Prowler, J. R. and Azzato, Nicholas. Chondrosarcoma of the mandible: report of case 62 May
Stoopack, J. C. Reticulum cell sarcoma of the mandible: report of case 73 Mar.
Van Gaasbeek, J. B., et al. Fibromycochondrosarcoma of the mandible 89 May Abstract
Vassar, P. S. Chondrosarcoma of the tongue 85 Mar. Abstract
SCHLUGER, SAUL; COHEN, D. W.; CHAIKIN, BERNARD; FOX, LEWIS AND GOLDMAN, H. M.: See Goldman, H. M.
SCHNEIDER, PAUL. Postoperative edema and its reduction by trypsin 49 May
SCHWARZ, ALFRED AND LANE, STANLEY: See Lane, Stanley
SCOFIELD, H. H. Blue (Jadassohn-Tieche) nevus: a previously unreported intraoral lesion 4 Jan.
SEDATIVES
See also Premedication
SERLING, J. M. AND TEBO, H. G.: See Tebo, H. G.
SHAFER, W. G. AND STANDISH, S. M.: See Standish, S. M.
SHARMA, K. D. AND SHRIVASTAV, J. B. Ectopic mixed salivary gland tumors of lips 86 May Abstract
SHEDD, D. P., et al. Survey of tongue cancer over a fifteen year period in a general hospital 87 Mar. Abstract
SHERMAN, PINCUS; WEINSTEIN, ISADORE AND MALKIN, MORTON: See Malkin, Morton
SHRIVASTAV, J. B. AND SHARMA, K. D.: See SHARMA, K. D.
SIALOGRAPHY
See Salivary glands—diseases
SINUSES OF FACE
Cooksey, D. E. and Middleton, R. A. Management of oral surgical problems complicated by maxillary sinus involvement 14 Jan.
Periapical pathosis in teeth which are in direct relation to the maxillary sinus need not exclude them as candidates for a root resection 84 July
SMALL, I. A. AND BLOOM, H. J. Hemangiopericytoma of the sublingual fossa: report of a case 65 July
SMITH, D. C. Growth and the ameloblastoma: report of case 75 May
SPECIALISTS
EDUCATION, DENTAL: See Education, dental—specialists
LICENSURE: See Licensure—specialists
SPIEGEL, L. H. Penicillinase treatment of allergic penicillin reactions 27 May
STAFNE, E. C. Oral roentgenographic diagnosis (Book rev.) 84 Mar.
STAINLESS STEEL AND CHROME ALLOYS
Lane, S. L., et al. Vitallium implant for transected portion of the mandible 90 May Abstract
STANDISH, S. M. AND SHAFER, W. G. Mucus retention phenomenon 15 July
STAPLES, W. R. Ossifying fibroma of the mandible: report of case 68 Mar.
STERILIZATION AND ASEPSIS
Haberman, Sol. Disinfection, antibiosis and sterilization in modern dentistry 33 Nov.
Taylor, R. W. Asepsis in minor oral surgical procedures: a re-evaluation (Ed.) 87 Jan.
Walker, R. V. Sterilization of anesthetic cartridges in office practice 48 Nov.
STOOPACK, J. C. Reticulum cell sarcoma of the mandible: report of case 73 Mar.
STRAND, S. O. Primary tumors of the infratemporal and pterygopalatine fossae 89 May Abstract
STREAN, L. P. Stress phenomenon as related to surgical anesthesia 42 July
STRESS
Strean, L. P. Stress phenomenon as related to surgical anesthesia 42 July
STUTEVILLE, O. H., et al. Trypsin in the treatment of swellings of the head and neck—a preliminary report 87 May Abstract
SUCCINYLCHOLINE
See Muscle relaxants
SUMNER, W. C. Clinical approach to parotid gland tumors 81 Nov. Abstract
SUPERNUMERARY TEETH
See Teeth—supernumerary
SURGERY
ORAL: See Oral surgery
SWANKER, W. A. AND MAYER, D. M.: See Mayer, D. M.
SWELLINGS OF FACE AND NECK
See Edema; See also Parotitis

T

TANCHESTER, DAVID. Organization and scope of dentistry in hospitals 27 Mar.
TAYLOR, R. W. Asepsis in minor oral surgical procedures: a re-evaluation (Ed.) 87 Jan.
TEBO, H. G. AND SERLING, J. M. Loss of the lamina dura in hyperparathyroidism due to carcinoma: report of a case 68 May
TEETH
ANATOMY: See Anatomy—oral
EXTRACTION: See Extraction
IMPACTED: See also Extraction—impacted teeth
IMPLANTATION: See Implantation
REPLANTATION: See Implantation—natural teeth
SUPERNUMERARY
Quinn, J. H. and Lewis, Miles. Bilateral inverted supernumerary central incisors penetrating nasal cavity: report of case 61 Nov.
TRANSPLANTATION: See Implantation

TEMPOROMANDIBULAR JOINT
DISEASES AND DYSFUNCTIONS: See also Mandible and maxilla—resection
Temporomandibular joint trauma 66 Nov.
TETANUS
Hoyne, R. M., et al. Tetanus complicated by impacted dentures: report of case 59 July
TETRACYCLINE
See Antibiotics
THOMA, K. H. Oral surgery (Book rev.) 82 Mar.; Treatment of jaw fractures, past and present 30 Sept.
THOMPSON, E. C.; HOYNE, R. M. AND WILKINSON, H. W.: See Hoyne, R. M.
THYROID DISORDERS
See Endocrine glands and hormones
TIC DOULOUREUX
See Neuralgia—trigeminal; trifacial; tic douloureux
TONGUE
DISEASES
Crowe, W. W. Neurilemmoma of the tongue: report of case 65 Mar.
Shedd, D. P., et al. Survey of tongue cancer over a fifteen year period in a general hospital 87 Mar. Abstract
Vassar, P. S. Chondrosarcoma of the tongue 85 Mar. Abstract
TRAEGER, K. A. AND LESNEY, T. A.: See Lesney, T. A.
TRANQUILIZING AGENTS
See Ataraxics
TRANSPLANTATION OF TEETH
See Implantation
TRELEASE, S. F. How to write scientific and technical papers (Book rev.) 86 July
TRIEGER, N., et al. Significance of liver dysfunction in mouth cancer 78 Nov. Abstract
TRIFLUPROMAZINE
See Ataraxics
TRIGEMINAL AND TRIFACIAL NEURALGIA
See Neuralgia—trigeminal; trifacial; tic douloureux
TUMORS
See also names of tumors
Angelo, J. J. and Bentzel, G. W. T. Unusual cartilaginous tumor of the symphysis of the mandible 87 May Abstract
Black, B. M. Tumors of the parathyroid glands 86 Mar. Abstract
Brown, R. L., et al. Tumors of the minor salivary glands 73 Nov. Abstract
Byars, L. T., et al. Tumors of salivary gland origin in children; a clinical pathological appraisal of 24 cases 88 Mar. Abstract
Colby, R. A. and Gerry, R. G. Mixed tumor of floor of mouth in a seven year old child: report of case 75 Jan.
Coley, Bradley, et al. Giant-cell tumor of bone 88 Mar. Abstract
Crowe, W. W. Neurilemmoma of the tongue: report of case 65 Mar.
Dingman, R. O. Hemangiopericytoma 91 Mar. Abstract
Garcelon, G. G. Salivary gland tumors 78 Nov. Abstract
Greely, P. W. and Curtin, J. W. Papillary cystadenoma lymphomatosum (Warthin's tumor) 91 Mar. Abstract
Hayward, J. R. Malignant giant cell tumor of the mandible: report of case 75 July
Holland, M. R. and Chaudry, A. P. Mixed tumor of the palate: report of case 59 May
Keim, W. F. Management of recurrent mixed tumors of the major salivary glands 87 May Abstract
Kerr, D. E. Epithelial neoplasms of the salivary glands: their histology and their behavior 1 July
Lane, Stanley and Schwarz, Alfred. Infantile hemangioendothelioma of the parotid gland 88 May Abstract
Sharma, K. D. and Shrivastav, J. B. Ectopic mixed salivary gland tumors of lips 86 May Abstract
Small, I. A. and Bloom, H. J. Hemangiopericytoma of the sublingual fossa: report of a case 65 July
Strand, S. O. Primary tumors of the infratemporal and pterygopalatine fossae 89 May Abstract
Sumner, W. C. Clinical approach to parotid gland tumors 81 Nov. Abstract
TURNER, D. D. Virchow's metamorphosis of the salivary glands 91 Mar. Abstract
TYLMAN, S. D., et al (Edited by) Year book of dentistry: 1957-1958 series 83 May

U

UHLER, I. V. How Blue Shield has affected my practice 52 July

V

VALLERY-RADOT, PASTEUR. Louis Pasteur (Book rev.) 83 Mar.
Van GAASBEEK, J. B., et al. Fibromyxochondrosarcoma of the mandible 89 May Abstract
VAN ZILE, W. N. Carcinoma in a healing alveolus after a dental extraction: report of case 82 Jan.
VASSAR, P. S. Chondrosarcoma of the tongue 85 Mar. Abstract
VIRUS DISEASES
See also Hepatitis
VITALLIUM SCREWS, APPLIANCES, ETC.
See Stainless steel and chrome alloys

W

WAGNER, W. A. AND HUBBELL, A. O. Pain control with a mixture containing dextro propoxyphene hydrochloride, a mixture containing codeine phosphate and a placebo 14 Nov.
WALKER, R. V. Sterilization of anesthetic cartridges in office practice 48 Nov.
WEINSTEIN, ISADORE: SHERMAN, PINCUS AND MALKIN, MORTON: See Malkin, Morton
WEYL, RUTH, et al. Clinical evaluation of a new ultra-short-acting oxygen barbiturate for intravenous anesthesia 90 July Abstract
WHARTON'S DUCT
See Salivary glands; See also Calculus—salivary
WIGAND, F. T. Simultaneous carcinoma of upper and lower lip: report of case 78 Jan.
WILKINSON, H. W.: THOMPSON, E. C. AND HOYNE, R. M.: See Hoyne, R. M.
WISHART, C., et al. Dental extractions in haemophilia 86 Mar. Abstract
WYCKOFF, H. C. AND BRAESTRUP, C. B.: See Braestrup, C. B.

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INDEX TO ADVERTISEMENTS

Abbott Laboratories 95

American Dental Association
- Dental Abstracts 96
- Relief Fund 94

Bristol-Myers Company..... 2nd Cover

Carrick Travel Bureau..... 96

Cook-Waite Laboratories, Inc.. 3rd Cover